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CARDIOLOGY AND THE GENERAL PRACTITIONER*

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ABNORMAL circulatory phenomena occupy rather a large part of the general practitioner's time. In some cases they are his chief concern; in many more they arrest his attention even though his primary interest may be otherwise directed. For some of them he finds ready explanation. Others present problems of greater difficulty. He is sometimes confused by apparent contradictions. A man rejected for life insurance lives long in good health while another recently accepted without question dies suddenly of coronary occlusion. A patient with signs of serious heart disease stands an emergency operation well, while another with little evidence of circulatory disorder suffers collapse. A woman yet in her twenties dies of rheumatic heart disease while another in her fifties who has had well defined mitral disease for forty years sails for Europe on a pleasure trip. The practitioner finds bradycardia in one patient with brain tumor, in another with heart block. Extreme tachycardia accompanied by auricular fibrillation he encounters in patients with thyrotoxicosis who later exhibit no abnormal cardiac signs, and also in patients about to die of heart failure. He observes regularity of heart action without acceleration and without murmurs in patients on their death beds and he sees men doing hard work who exhibit systolic murmurs and whose heart beats rapidly. In one case certain cardiac signs present no special problem, in another grave questions await their proper interpretation.

In explaining such apparent contradictions certain physiological principles must be kept in mind. Not only is the circulation vital to all tissues of the body but it is also the chief means of correlating the activities of the various parts. Only through it do the several organs function as members of a single body. In health the demands upon the circulatory system are constantly changing and in order to meet these demands it responds easily and quickly to many and varied influences. This lability of the circulation is especially valuable in disease where an observed phenomenon is often the resultant of many factors. Thus it is that pathological processes widely different in character may be accompanied by circulatory phenomena quite similar in kind, while different signs may result from disorders closely related in origin.

In every instance circulatory signs and symptoms must be considered in their relationship to other aspects of the case. Abnormal circulatory manifestations cannot be regarded as independent or as isolated phenomena. This being true, therapeutic procedures in most instances should not be directed primarily against them. It is rather to the underlying pathological process responsible for the observed effect that direct consideration should be given. Exceptions occur. In some instances the primary process cannot be discovered. Secondary disease processes in general may themselves be attended with danger, with pain, or with annoyance. Under any of these circumstances they must be directly treated unless the cause may be readily removed or controlled. But such exceptions should not divert us from general principles nor distort our perspective. It is the purpose of this paper to apply these fundamental conceptions to certain abnormalities of the circulation commonly encountered in general practice, particularly to certain abnormalities of heart rate and of heart rhythm.

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Simple Tachycardia.—Simple tachycardia in many instances represents an adjustment of the circulation to pathological processes and should not receive special therapeutic consideration. Therapy in such cases obviously should be directed not toward slowing the heart, but toward mitigating the cause of tachycardia. Mere slowing may indeed upon occasion be harmful. The initiation of direct measures to lessen the heart rate in hemorrhage, in pneumonia, in fright or in exophthalmic goiter would appear as illogical as the taking of similar means to slow the respiratory rate in the same circumstances; as illogical as trying to slow it after exercise.

The assumption is widespread that tachycardia itself is attended by serious danger if long continued; that the heart cannot long withstand rapid beating. This conception has received an emphasis which appears to be unwarranted. The heart is physiologically adapted to rapid action. Increase in rate *per se* does impose added burden, but a normal heart bears the burden well. Furthermore, compensatory adjustments usually supervene. Even a diseased heart usually appears to suffer little impairment of function from tachycardia of considerable extent, provided the muscle is activated in normal fashion, *i.e.*, provided the tachycardia originates at the normal pacemaker. In a diseased heart obviously the danger of fatigue from tachycardia may be enhanced, but even in such cases compensatory adjustments in stroke output and in vascular tension usually relieve the heart of this added danger. In many instances, indeed, the accelerated action itself appears to be a compensatory adjustment, tachycardia representing the effect of circulatory impairment, not its cause. Surely the chief indication of therapy in such cases should be the protection of the heart from further danger, not an unphysiological adaption to injury already received.

Not only is it inadvisable, in many instances, to slow the rate in simple tachycardia, but in adults it is rarely possible by therapeutic means to do so. In therapeutic dosage digitalis rarely, if ever, in adults causes slowing of consequence by direct action upon the cardio—inhibitory apparatus. The physician who pushes digitalis in such an attempt, even if slowing be desirable, subjects his patient to the serious danger of digitalis intoxication.

Abnormal Rhythms.—Abnormalities of cardiac mechanism in general have been given a prominence altogether out of proportion to their importance. In most instances the principles of treatment and the management of the patient are not influenced by their presence or absence. Certain exceptions to this rule will be noted below. One might say that cardiology after emerging from the age of murmurs and before reaching the light of the functional era was for a decade or more confused in the dark period of abnormal rhythms. But it is emerging from the dark age and is beginning to lay aside some of the terror inspired by the mythology of abnormal rhythms.

Upon occasion, it is true, a patient's heart behaves as if under the spell of an occult influence, and all effort to exorcise the demon appears to be of no avail. Such visitations are comparatively rare. Better understanding has taught us that, as a rule, abnormal rhythms are not fearsome, and upon occasion are indeed quite friendly. In most instances not only is the general plan of treatment unaffected by the presence of such a disorder, but even the disordered rhythm itself demands no special therapy. It is properly ignored. Not infrequently, on the other hand, the occurrence of an abnormal rhythm, far from being inspired by an evil spirit to confuse us, proves but a friendly warning, a sign to point away from danger into the way of better treatment. Instead of trying to do away with the signal, we should, rather, accept its generous warning and lend our effort to overcome the danger it helps us recognize. After we have succeeded in doing this, the portent often vanishes only to reappear, perhaps, as danger is approached again. It thus becomes a useful gauge of proper therapy.

Auricular Fibrillation.—These considerations apply with special force to auricular fibrillation. Most patients with this disorder need treatment. So do most patients with fever and most patients with abnormal blood pictures. But usually it is better therapy to direct treatment against the cause of the fever or of the blood dyscrasia than to try blindly to change the temperature chart or the blood count by any means available. And even though the thoughtful physician gives much attention to these charts, finding them invaluable as guides, he still remembers that the object of his therapy is not a certain level of temperature

or of blood, but a certain therapeutic result indicated by the chart he studies.

And so it is with auricular fibrillation. The great addition to our knowledge afforded by study of auricular fiibrillation and its graphic registration has so impressed medical practice that this disorder itself too often assumes chief place in therapy. Although exceptions occur, in the vast majority of cases it is not the disordered mechanism that needs treatment, but the disease process producing the abnormal rhythm. Treatment of this differs in different cases, the course of the auricular fibrillation being merely incidental. Rarely should it receive special treatment. The following examples are illustrative:

A patient after operation for toxic adenoma develops auricular fibrillation with tachycardia. The presence of the fibrillation alters the general aspect of the case very little, but fortunately it does make the picture of the "crisis" more distinct, thus defining more clearly the indication for iodine or other measures to meet it. Cause and effect must not be confused. The primary consideration in treatment must be the crisis, not some particular manifestation of the toxic effect.

A patient with rheumatism receives a specific vaccine, after which rise of temperature and auricular fibrillation develop. The auricular fibrillation is an incident in the reaction to excessive vaccine therapy, not the cause of it. Under appropriate treatment the reaction subsides, the abnormal rhythm disappearing along with other manifestations of it.

A patient with heart failure and auricular fibrillation receives digitalis. So do patients with heart failure without auricular fibrillation. Treatment is the same in both cases, the auricular fibrillation constituting no indication for special therapy. The presence of fibrillation in such cases may furnish a valuable guide to digitalis dosage, the heart rate usually being an index, to some extent at least, of the efficacy of the drug. But the indication for digitalis in heart failure, let it be remembered, is not modified by the presence or absence of fibrillation. Auricular fibrillation *per se* is not an indication for digitalis.

During the course of pneumonia the occurrence of auricular fibrillation is not unusual. Recent study of a large series of cases over a two year period shows that the administration of digitalis was accompanied by increased mortality in those patients with auricular fibrillation as well as in those with normal mechanism. Since fibrillation in such cases must be regarded as an expression of toxemia, this result would appear to demand no special explanation.

Although as a rule auricular fibrillation constitutes no indication for special therapy, exceptions occur. Great prominence has been given to the notion that the extreme tachycardia which sometimes results from this disorder may upon occasion be the source of great danger apart from other aspects of the case and demand special treatment not otherwise indicated. It would appear that this conception practically limits such special therapy to quinidine, and confines its employment under such circumstances to cases without heart failure. For surely in cases of this sort associated with heart failure digitalis is indicated irrespectively of the fibrillation and irrespectively of the tachycardia, and could not, therefore, be regarded as a special measure. Quinidine, furthermore, as a rule, is contraindicated in heart failure. In those cases of auricular fibrillation with excessive tachycardia unassociated with heart failure, on the other hand, due to toxemia or other cause, digitalis rarely is very effective, and may, indeed, be a source of danger. If this conception of the life-saving effect of quinidine is indeed correct, the occasion for its employment confronts the practitioner but rarely, and it, too, would appear to be not devoid of danger.

More commonly, cases of auricular fibrillation in which special therapy is indicated appear to fall into the other category, *i.e.*, that group of cases in which the disorder constitutes not an element of danger but a source of annoyance. In cases of this group in which the fibrillation cannot readily be eliminated by removal of the cause, and which present no contraindication to the administration of quinidine, this drug upon occasion may be employed with good results. It must be remembered, however, that cases of auricular fibrillation falling into this group constitute but a small proportion of total cases.

Extra Systoles.—In general, what has been said regarding auricular fibrillation applies also to extra systoles. In most instances patients exhibiting such interruptions to regular heart action should be treated precisely as they would be did

the heart beat rhythmically. If the primary cause can be discovered, it should receive principal, if not entire, consideration. Toxemia must be combatted, infection removed, nervousness allayed. Tobacco may have to be eliminated, gastro-intestinal disorders corrected. Many patients are unaware of their occurrence. It would sometimes be better if this ignorance extended also to their medical advisors. But these disorders, too, upon occasion are helpful. They may suggest greater detail in examination or in history taking, or may demand closer consideration to therapeutic measures already in use.

Like auricular fibrillation they may demand special treatment. Occasion for this arises not from any danger inherent in the arrhythmia, but from the annoyance produced by it. A rather large proportion of those who are aware of extra systoles are greatly perturbed or annoyed by them. Strychnine is the drug of choice. In doses of 1/60 to 1/40 of a grain three times a day it stops the occurrence of extra systoles in many instances. The addition of small doses of quinine and of one of the barbituric acid derivatives frequently appears to be of value. Quinidine is often useful.

Heart Block.—Heart block is an expression of myocardial injury, an index of damage. In those cases in which the myocardial lesion results from infection or other acute process, removal of the cause usually results in restoration of function to the conducting tissue. The heart needs no special treatment, nor is special treatment often effective in removing the block. The patient needs careful management in an illness of such severity whether the conduction of impulses from auricle to ventricle is accomplished or not.

In chronic cases the prospect for recovery of conduction is poor with or without special treatment. The pathological process responsible for the block is rarely modified enough to restore conductivity. It is usually an index of grave injury to the myocardium and on that account rather than because of the bradycardia it lends gravity to prognosis. In these cases, too, the abnormal rhythm usually should be ignored in treatment. Tinkering is often dangerous.

The presence of Adams-Stokes attacks alters the situation. The danger here lies not simply in the failure of a-v conduction. The critical nature of the seizures demands the employment of measures offering any prospect of relief. Barium chloride in the interval, epinepherine during the attack, have been productive of good results.

Paroxysmal Tachycardia. — Paroxysms of tachycardia more commonly than other abnormalities of rhythm may demand special therapeutic measures. From their very nature, however, such paroxysms, whether auricular fibrillation, auricular flutter, auricular or ventricular tachycardia usually end spontaneously. Except in those cases in which the ventricular muscle parts are activated in abnormal sequence (ventricular tachycardia), there is rarely evidence of deficient circulation even with attacks of relatively long duration. And even in these cases the prognosis, as a general rule, is good so far as the particular attack is concerned. Necessity for special treatment, therefore, in paroxysms of tachycardia is the exception rather than the rule. These attacks may occur in patients without other cardiac abnormality, while upon occasion the cardiac lesion is so grave that life or death may depend upon the measures employed. The danger of doing too much is often as great as that of doing too little. The necessity of "doing something" may not be as urgent as the obligation of doing nothing harmful. Under such circumstances surely the thoughtful physician, whether general practitioner or specialist, would choose the company of those who tread with fear rather than rush into ill considered therapy. The indication for treatment in the vast majority of cases consists not in any danger from the attack but in the discomfort and perturbation produced by it. The patient should be put at rest, and sedatives or opiates administered as indicated. Not the least of quieting measures may be the reassurance which in most instances can be truthfully given. Differentiation, while frequently accomplished at the bedside, may be impossible without instrumental means. Pressure over the carotid sheath may be not only an important procedure in differential diagnosis but in paroxysms of regular auricular type it may be effective also in stopping the attack.

After a reasonable time if the attack does not end spontaneously, and if carotid pressure has been ineffective, special measures may be employed. The precise treatment may depend upon the type of paroxysm, and upon the circumstances of its occurrence. Extended discussion

of the use of quinidine and of digitalis in the various types of tachycardia occurring in paroxysms would require space beyond the limit of this paper. In many instances these drugs control or stop such disorders. Upon other occasions it is unnecessary or unwise to use them. Rarely can the employment of either be regarded as an emergency measure.

In these disorders of rate and of rhythm, as well as in cardiac disorders generally, a complete history and a general examination are of more value in determining treatment than examination of the heart; in the examination, physical signs are of more value than graphic records. The following case well illustrates this rule, even though it constitutes an exaggerated example. A few days after operation a patient suddenly was seized with a paroxysm of tachycardia. The electrocardiogram showed ventricular complexes occurring regularly, but no one who examined the record felt confident of a precise electrocardiographic diagnosis. A second record, obtained a few hours later, in places showed ventricular complexes occurring regularly, in other places irregularly. Digitalis was ordered, and after this quinidine. The paroxysm soon ended. At no time had evidences of circulatory insufficiency been apparent. Later it was discovered that for twenty years the patient had been subject to frequent attacks of rapid heart action, in only a few of which had a physician been called. The attacks had always ended spontaneously, sedatives having been administered upon only a few occasions.

SUMMARY

Simple tachycardia frequently represents a compensatory adjustment of the circulation. When primary, compensatory adjustments usually follow it. Direct measures to slow the rate are rarely indicated and are rarely successful when tried.

Abnormal rhythms in the vast majority of instances require no special therapeutic measures. Some of them frequently are valuable hints in diagnosis and useful guides in therapy. They call for general examination and treatment, not merely for examination of the heart and cardiac drugs. The abnormal rhythm itself is rarely dangerous; it is frequently annoying. Special treatment, therefore, when indicated, is rarely an emergency measure. In most instances a complete history is more important than a complete cardiac examination.

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PRENATAL CARE AND THE CAREFUL CONDUCT OF DELIVERY*

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IN 1923 I read a paper before this association entitled: "Obstetrics and the General Practitioner." In that paper I emphasized the value of prenatal care. I brought out the fact that only 15 per cent of my obstetrical cases were reporting for such care. Furthermore, I stressed the point that it was the duty of every physician, doing obstetrical work, to educate the public that it might see the great value of prenatal care for the expectant mother and her child.

In 1929, in discussing a paper presented at the annual meeting of the State Association, I mentioned the fact that a careful review of my obstetrical cases showed that those coming in for prenatal care had in six years increased from 15 per cent to 83 per cent. And today I find that during the two years that have elapsed since May, 1929, 90 per cent of all obstetrical cases delivered by me have appeared once or oftener for prenatal care; and over 50 per cent of these reported before the end of the fourth month. I have found, therefore, (1) that it is possible for the doctor in general practice, and in the rural community, to do prenatal work; (2) that it is possible by persistant and conscientious effort, to teach the mothers the value of prenatal care; (3) I have found that expectant mothers can be taught to come regularly for prenatal care, even from the very early months of gestation.

When expectant mothers know that the doctor is willing to give them care during pregnancy, they will come from the remotest corners. Through social workers, county nurses, through newspapers and publications of the State Board of Health, and the Department of Labor, at Washington, the public of today has gradually come to know a great deal about prenatal care and its important bearing on the health and life of both the mother and her infant. Expectant mothers will go to the doctor who will give them such care. The doctor who is not willing to give prenatal care, has no right to expect to be called to the obstetrical case at the time of delivery.

I charge a reasonable price for my obstetrical cases, but make no extra charge for prenatal care given at the office. The cost, therefore, to the patient, is the same whether she comes in for prenatal care or not. It is a little difficult to teach these patients not to come in on Sundays and holidays, and after office hours at night. At one time I used to make a small charge for each call, if the patient came on "the day of rest," or at night. But now I make that a part of "that second mile," and smile in so doing.

Careful records must be kept of all obstetrical cases. I have a record card, six by eight inches, folded in the middle, printed especially for my obstetrical cases. Any size card, however, will do. The first prenatal call includes a complete physical examination as well as a past history of the patient. This first call will require twenty or thirty minutes. Subsequent calls will require only five or ten minutes of the doctor's time. And, if necessary, the well trained nurse can do most of the routine examination at these subsequent calls.

At the time of the first call careful pelvic measurements are made. The heart, lungs, kidneys, and the breasts are examined. The blood pressure is recorded. The mouth and throat are examined for possible foci of infection. These days, especially in primiparas, it is important to note the general nutrition, and to examine the lungs carefully, because of the high incidence of tuberculosis among young women. The general health of the patient must be considered. Malnourishment must be corrected. Many young women of today have highly sensitive nervous systems from various causes, and consequently we find among them many nervous and mental problems when they become pregnant. These neurotics are very often exceedingly hard to manage. They constitute one of the difficult, as well as one of the unpleasant problems, that a doctor has to deal with in doing prenatal work. They are worried, they did not want to become pregnant in many cases, they are afraid of pregnancy. The big majority of cases of vomiting of pregnancy are neurotic in origin and very seldom toxic. Often these patients vomit incessantly and

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clamor for the doctor to terminate the pregnancy. At times they must be hospitalized and isolated. Usually, however, they ultimately respond to the proper treatment. And one must always be alert to distinguish between the neurotic and the toxic types of vomiting.

During the first seven months, if everything is normal, the patient need not report more than once a month. But during the eight and ninth months, she must report every two weeks. If any abnormality develops, the patient must report more frequently, and if a grave condition threatens, the patient is seen at her home or she may be hospitalized according to the gravity of the condition.

Even the very busy physician can afford to spend five or ten minutes a month or twice a month, to give the necessary prenatal care to his obstetrical cases. As a routine at the regular visits, the kidneys, the heart, and the blood pressure are examined. The general condition of the patient is observed, and any conditions, like "heart-burn," constipation, headache, puffiness of the eye-lids and feet, varicose veins of the legs and feet, are observed and corrected. Anything that points to beginning toxemia is noted and "nipped in the bud." Thus serious toxemias can be prevented. Toward the end of pregnancy the position of the child is noted. In general, the object of prenatal care is to bring the mother and the child safe and sound up to the time of delivery, and with as little discomfort, worry, and grief to the mother as possible. And when this has been accomplished, the whole battle of child bearing is more than half over. When labor sets in, the doctor knows his case, and the mother and her family know the doctor. Under these circumstances, the mother does not go into labor frightened and uncertain as to the outcome.

What are the results of prenatal care? Prenatal care saves the lives of mothers and infants. In the United States at large, there has been little, if any, reduction in the maternal mortality rate during the past fifteen or twenty years. If such a reduction comes, it must come through proper education of the public, proper prenatal care, and proper care of the mother during the delivery. There are many doctors in Minnesota who are training their patients to report for prenatal care, and by such care the maternal as well as the infant mortality rate, and the morbidity rate, are being cut down materially.

In California in 1920 the maternal mortality rate per thousand total births (including still-births) was 6.8. As a result of prenatal care in that State the maternal rate has been cut to 5.1 per thousand total births, a saving of almost two hundred mothers in that state alone.

According to the department of health in New York City the death rate among pregnant women who had the proper prenatal care was only one half as high as it was among those who had no such care.

In Kentucky, the prenatal clinic of the Louisville City Hospital has published some interesting statistics on the value of prenatal care. During a five year period ending in 1928 there were 3,217 deliveries. Of these, 2,061 attended the prenatal clinic, while 1,156 had received no prenatal care. In the first group there were only six deaths, or 2.91 deaths per thousand. Of the 1,156 who received no prenatal care twenty-six died, a rate of 22.4 per thousand deliveries. Over 3 per cent of those with no prenatal care developed eclampsia and ten died, while only a little over 0.5 per cent of those with proper prenatal care developed eclampsia and none of these ended fatally.

A report of the demonstration made by the Commonwealth Fund, shows the great value of preventive medicine in the field of prenatal care. The figures taken from four typical American communities, (Fargo, North Dakota; Rutherford County, Tennessee; Marion County, Oregon; Clark County, Georgia), show that the "Maternal death rate, still-births, and infant mortality under one month of age, were double in the group that received no prenatal care."

I take the liberty of quoting from an article by Doctor Polak of Brooklyn. He says, "In Brooklyn in the district influenced by our prenatal Clinic not only has the mortality in eclampsia been lowered, but severe eclampsia is an exception." . . . "This we attribute to continuous prenatal propaganda." This same authority gives the maternal death rate per thousand in a series of 12,066 cases, which were divided among five different hospitals and teaching units. All of these patients received prenatal care and good care during delivery. The average maternal death rate for the whole series was 3.5 per thousand, while the rate for the city at large was twice that high.

If we who do obstetrical work can cut the

maternal mortality rate down from 6.2 which it is in the United States today, to 3.5 as has been done in these teaching clinics in Brooklyn, we would by so doing save annually seven thousand mothers.

True we cannot reduce the death rate to nil, because of the difficult cases that will develop, and because of miscarriages, abortions, poor health, improper hygiene, etc., but we can cut the death rate in two. What has been of such great benefit to individual communities will be of equally great benefit to the State of Minnesota and to the country at large.

Originally I was supposed to speak on prenatal care only. But, I added a coda to my subject, namely: "The Conduct of Labor." This was done because I wish to bring out one or two points in this connection.

In the rural districts, as well as in some homes in the city, the environment is often very unfavorable for the proper conduct of labor. The doctor and his nurse may do all in their power to carry out good technic during the delivery, but the hygienic environment as well as the type of intelligence and the conduct of the patient and the attendants may be decidedly against them. But, however unfavorable the environment one thing is certain, and that is this: If at the time of delivery one resorts to external abdominal examinations and rectal examinations only, one is not introducing any of the infectious material that surrounds the patient, into the parturient canal. I always keep this in mind that the vaginal secretions are almost always sterile, and, furthermore, that the vaginal flow is always outward. The only thing that goes in is the examining finger of the doctor. And if during delivery he makes no vaginal examinations he can rest assured that he has not introduced any infectious organisms.

The doctor in general practice must care for cases of virulent infection of every sort, and no matter how careful he may be, virulent organisms cannot be completely scrubbed from the hands. Sterile gloves should be carefully put on, rectal examinations should be made, and vaginal examinations resorted to only when absolutely necessary.

In an exhaustive article by Holmes, Mussey, and Adair, we read this statement regarding puerperal infection: "The source of infection in connection with child bearing may be considered as endogenous and exogenous. Endogenous infection may be largely ignored. Practically all puerperal infection may be regarded as contact infection and therefore as contagion."

I take the liberty of quoting from an article by Doctor Litzenberg: "The two principal causes of maternal mortality are infection and eclampsia, both almost wholly preventable." . . . "Over eleven thousand deaths each year are due to these causes." . . . "By application of the simple requirements of prenatal care and asepsis at delivery, thousands of these women need not have died."

In teaching the importance of prenatal work and the careful conduct of labor where shall we start? The public is willing to learn, but how can the public properly learn unless there is someone to teach? The responsibility rests first and foremost with the physicians. In any phase of medicine where the physicians are in the forefront and where they are doing their full duty the state and federal governments will not step in. It is when we fail in our vigilance that outside factors are ready to enter. It is possible for the doctor to do conscientious prenatal work whether he be located in the city or in the rural community. It is possible by persistant effort to teach the public the value of prenatal care. And it is possible to train the pregnant mothers to come and to come early in pregnancy. The doctor must learn first in order that he may teach the public. And the doctor must be willing to spend both time and energy in teaching the public.

The instruction at the medical schools, and the internships must teach the medical students the importance of the careful conduct of delivery under every circumstance. It is impossible for most medical schools to give each and every student the practical training in delivering obstetrical cases that he should have. Such practical training should for the most part come during the internship. An obstetrical service during ones internship where one is required to care for and deliver a large number of normal cases as well as a certain number of abnormal cases should be required. The medical schools are giving splendid courses in obstetrics, yet most of the real practical work must come during the hospital service. Not so many years ago when I took my intern work I spent four months on the obstetrical service in a large hospital. Three hundred and eighty-six patients were delivered during those

months, many of them abnormal cases. I delivered any number of normal cases, but it was only after I got into private practice, when I had no staff member at my side to guide me, that I applied a pair of forceps for the first time, or did a version, or a breech delivery. In my first forceps case after I began private practice nature was very kind and let both the mother and the child live, but I trembled and "sweat blood" during the operation, and worried for days afterwards.

I have no large series of cases to draw from, and I have very little right as yet to quote any figures or draw any conclusions. I have, however, records of 1,342 cases. Among these I have had only one maternal death, and this was due to influenza contracted before delivery. There have been no cesarean sections; only one mutilation operation—this a case of an anencephelon. I have had only four cases of eclampsia, each developing only one or two convulsions, and I have never had to do a therapeutic abortion. I have, indeed, been fortunate. "My lines have fallen in pleasant places." But, if I have had a low mortality rate heretofore, in this small series, that is no guarantee that I will not lose a mother tomorrow, or next month, or two or three mothers by a year from now. But this I hope, that if I *do* lose any mothers it will not be because of my negligence.

In conclusion let me deviate from the scientific for a moment: A wayfaring man came upon three men working in a stone quarry. He said to the first one, "What are you doing?" The answer was, "I am cutting stone." He said to the second one, "What are you doing?" The answer was, "I am earning five dollars a day." He asked the third, "And what are you doing?" and this man answered, "I am building a cathedral." As true followers of Hippocrates we as practicing physicians are ever building "cathedrals" in all our work. But, we are especially building "cathedrals" when we save the lives of infants; and when we preserve the precious lives and the health of the mothers who are to care for these infants.

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PAUPERIZATION OF THE PATIENT

A few alarmed observers never tire of shouting that there is a skeleton in the closets of hospitals and clinics. It is called, they aver, Pauperization of the Patient, and is responsible on the one hand for undermining the morale of the sick one, and on the other for using its bony fingers to keep dollars from the pockets of deserving doctors. A study recently published by the Chicago Institute of Medicine brings the fearsome creature out into the open. Trained investigators, guided by a committee of physicians and a committee on economic and social factors, including representatives of the University of Chicago, the School of Social Service Administration, Northwestern University, the Julius Rosenwald Fund, the United Charities and the Council of Social Agencies, gathered elaborate data concerning more than five hundred consecutive hospital and clinic patients in six large medical institutions of Chicago. After the facts of earnings, rent, unemployment, size of family, presence or absence of automobile and the like, were brought together and weighed, it was found that a little less than 4 per cent of these patients might have paid more than they did for their medical care, at least for a time. But on the other hand five times that number—or 20 per cent of the whole lot—had paid out more, in the opinion of the investigators, than they could afford. They had gone without food to buy medicine, or had sunk into debt in order to pay amounts completely disproportionate to their resources. More than half of the whole group of patients had employed private physicians previously for their illness, and had resorted to free or part-pay services only when their money was used up. To determine the ability of a family to pay for medical service, the authors conclude, is a complex matter in which consideration must be given to many factors, including income, living standards, expense of previous illnesses and probable expense and outcome of the present one. —Editorial, *The Survey*, Feb. 15, 1931.

RECURRING PREECLAMPTIC TOXEMIA: ITS CLINICAL SIGNIFICANCE*

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PREECLAMPTIC toxemia occurs in approximately 3 per cent of pregnancies which are carried to the third trimester. In reporting the triple recurrence of eclampsia in the same patient, Laun, in 1928, reviewed the literature and stated that the percentage of recurrence of eclampsia is between 1.5 and 8 per cent. He expressed the belief that the higher rate is more nearly correct and quoted Bund who noted an increased incidence of recurrence of eclampsia in subsequent pregnancies. Schmechel reported 238 cases of eclampsia in 27,430 deliveries. Of these 238 patients, thirty-seven died primarily, two died during the course of the next year (cause of death unknown) and forty-one were not heard from. One hundred fifty-eight patients answered Schmechel's questionnaire. Eighty-three of these experienced subsequent pregnancies: thirty-five (42 per cent) without symptoms of eclampsia; thirty-three (40 per cent) with symptoms of eclampsia (five interruptions of pregnancy), and fifteen (18 per cent) with recurrent eclampsia. He quoted Zangmeister as stating that of forty-one patients with eclampsia who became pregnant later the eclampsia recurred in 12 per cent.

Gibberd reported fifty-one cases in which the patients were observed through at least two pregnancies at Guy's Hospital, the first pregnancy being associated with albuminuria. Four patients had chronic nephritis prior to the first pregnancy. The remaining forty-seven cases did not show evidence of nephritis early in the first pregnancy. In six of these cases in which the albuminuria was noted nine weeks (average time) prior to termination of pregnancy, chronic nephritis developed. In twenty-seven of the remaining forty-one cases in which recovery apparently was complete, the pregnancy terminated within three weeks of onset of albuminuria, and in fourteen cases later than three weeks afterward. In eleven (40 per cent) of the first group of cases and ten (70 per cent) of the second group, there was recurrence of toxemia in the second pregnancy. Gibberd expressed the belief that this indicates that residual injury is more common when the toxemia has been present for a longer period prior to delivery. He also quoted James Young who stated that in 31 per cent of cases of albuminuria of pregnancy the condition recurred. In a group of 225 patients with toxemia observed through two pregnancies, Kellogg noted that 80 per cent had recurrence of toxemia and elevated blood pressure.

The toxin causing preeclamptic toxemia produces more or less widespread arteriolar and capillary injury throughout the body, affecting chiefly the liver, kidneys, brain and heart. The liver, which appears to be almost invariably involved, has remarkable regenerative ability, so that patients recovering from the disease rarely, if ever, present symptoms of injury to the liver. The kidneys, which are perhaps less frequently and often less severely involved, may not recover so completely. In fact evidence indicates that a number of cases of chronic nephritis are a direct sequence of preeclamptic or eclamptic toxemia.

Caldwell and Lyle reported an incidence of 8 per cent of chronic nephritis after eclampsia. Gibson found that in five of fourteen cases of eclampsia and in two of twelve cases of preeclampsia chronic nephritis developed. Gibson quoted Koblanck as stating that 6.5 per cent of women had chronic nephritis as a result of toxemia of pregnancy. Harris, in a study of examinations of patients one year postpartum, found that three of twenty-seven patients with eclampsia and 60 per cent of patients with preeclampsia showed definite signs of chronic nephritis. Peckham observed that 12.2 per cent of primiparæ and 39.3 per cent of multiparæ had nephritis following preeclamptic toxemia. In his cases nephritis did not subsequently develop when the systolic blood pressure remained less than 170. When the systolic blood pressure was between 170 and 200, 15 per cent of the patients had nephritis, and when it was more than 200, 48 per cent had nephritis. Mussey, Keith and Rock-

*From the Section on Obstetrics, The Mayo Clinic. Read before the Minnesota State Medical Association, Minneapolis, May 5, 1931.

wood reported fifty-seven cases in which chronic nephritis developed as a result of preeclamptic toxemia. After observing 225 patients with preeclamptic toxemia through two pregnancies sixty-eight of whom were observed through more than two pregnancies, Kellogg stated, "We have a general impression from this group that, on the whole, as progressive pregnancies occur, the patients tend to get worse earlier in pregnancy and that we are able to demonstrate with added pregnancies more and more established nephritic patients."

Albuminuria, hypertension and edema are often apparent earlier in pregnancy in cases of chronic nephritis than in cases of preeclamptic toxemia, usually before the seventh month. The specific gravity of the urine is fixed or low and tests of renal function often disclose retention of nitrogen and phenolsulphonephthalein. Usually blood pressure is elevated and often there are changes in the ocular fundi resulting from previous acute nephritis. However, as Gibberd, and Kellogg have indicated, the injury to the kidney may be so slight that it is revealed only by the test of subsequent pregnancy.

I have observed ninety-seven patients with toxemia of the later months of pregnancy in a series of 2,906 deliveries, an incidence of 3.3 per cent. Ten patients had eclamptic convulsions, eighty had preeclamptic toxemia and seven had a history or evidence of nephritis prior to the first pregnancy. Thirty-five (36 per cent) of the ninety-seven patients were observed through at least one ensuing pregnancy; two of these patients had preëxisting chronic nephritis. One patient with eclampsia and thirteen with preeclampsia did not have toxemia in subsequent pregnancies. Nineteen (57 per cent) of the thirty-three patients with toxemia who had not had chronic nephritis experienced recurring toxemia in an ensuing pregnancy. Four of these, one of whom had eclamptic convulsions in the first pregnancy, had no evidence of persisting arterial or renal injury. Seven patients manifested suggestive but not conclusive evidence of chronic nephritis. Eight patients with recurring toxemia, none of whom gave a history or clinical or laboratory evidence of nephritis prior to the first pregnancy, showed definite evidence of a more or less severe grade of chronic nephritis, following one or more pregnancies in which there was preeclampsia; one of these patients had eclamptic convulsions in the second pregnancy. In one case of preeclamptic toxemia, in which the patient did not become pregnant again chronic nephritis developed.

None of the ten patients with eclampsia had prenatal care. Two became pregnant subsequently; one patient had recurring toxemia and one did not. Three patients died and two subsequently had chronic nephritis.

Of the ninety-seven patients with toxemia 26.8 per cent had more or less adequate prenatal care; 17.5 per cent had entirely inadequate care and 55 per cent had no care. Patients with recurring toxemia were about equally divided in the type of prenatal care.

Preeclamptic toxemia occurs during pregnancy as a primary disease of women without preëxisting evidence of disease of the liver or kidneys. During the course of preeclamptic toxemia many women manifest clinical evidence of acute renal injury. The types of injury may be grouped as follows:

(1) If the injury is slight, perhaps merely a circulatory disturbance, or slight degenerative changes, recovery may be complete; (2) if the injury is more severe it may become permanent, although so slight that it may not be detected by any test of renal function now available except the test of subsequent pregnancy, and (3) the injury may be sufficient to produce unquestioned chronic nephritis.

When patients who have had preeclamptic toxemia become pregnant again it will be observed that a large proportion (60 per cent in this report) will have symptoms of toxemia. Certain patients classified in group 1 will escape and others, although they may have completely recovered from the previous toxemia, will have recurrent toxemia as a result of the same unknown toxin which produced it the first time.

A larger proportion of patients in group 2 will be affected either by recurring toxemia or by symptoms arising from previously undetected chronic nephritis. Patients of groups 1 and 2 would probably fall in the group Stander has termed "low reserve kidney."

Most of the patients of group 3 will have symptoms, due in part to toxic factors and in part to the chronic nephritis caused by the previous toxemia.

Injury to blood vessels may occur even when there is no apparent renal injury. Following pre-

eclamptic toxemia patients have been observed through several pregnancies with progressive arteriosclerosis and hypertension, but without demonstrable evidence of renal insufficiency.

COMMENT

A small proportion of pregnant women, possibly 3 or 4 per cent, have preeclamptic toxemia primarily. Evidence seems to indicate that a majority of the patients who have had preeclamptic toxemia will have similar symptoms in ensuing pregnancies. If this is so, it is evident that an attack of preeclamptic toxemia frequently causes some impairment of the patient's resistance to a subsequent attack, which may be due to: (1) lowering of physiologic defense; (2) sensitization of the tissues to certain foreign proteins, perhaps elaborated in the placenta or fetus or both, or (3) actual injury to tissues caused by the toxin. Little information is available concerning lowered physiologic protection or foreign protein sensitization following preeclamptic toxemia. Of the tissues or organs affected by this disease, the kidney is the organ which gives the most common clinical indication of the course and severity of the disease. When permanent injury follows an attack of preeclamptic toxemia the kidneys appear to bear the brunt of this injury.

SUMMARY AND CONCLUSIONS

Most patients who have had preeclamptic toxemia will have recurring toxemia if they become pregnant subsequently.

Recurring toxemia is probably due to the same factor or factors producing the original attack and affecting: (1) patients who have completely recovered from a previous attack; (2) patients with undetected residual renal or arterial injury subsequent to a previous attack, and (3) patients with definite chronic nephritis which existed before or developed subsequent to the previous preeclamptic toxemia.

In this series none of the patients with eclamptic convulsions had prenatal care and most of those with preeclamptic toxemia either had no care or the care was inadequate. In most instances a physician was not consulted until symptoms of toxemia were evident to the patient or relatives.

Adequate prenatal care for all pregnant women should lower the incidence of toxemia. Such care is possible only if the expectant mother consults her physician early in pregnancy and cooperates fully in carrying out his instructions.

The frequency of recurrence of preeclamptic toxemia and the relative frequency of residual chronic nephritis following this disease emphasizes the need for postnatal care and the importance of keeping certain patients under observation beyond the usual six or eight weeks, if need be, for six or more months after delivery. A woman who has had preeclamptic toxemia should not become pregnant again until a year or more has elapsed, and only after examination and estimation of the functional ability of the kidney to stand the strain of pregnancy.

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ACCIDENTS OF LABOR*

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THE successful practice of obstetrics requires a reasonable knowledge of several different specialties. The pregnant woman may suffer from any disease during her nine months term. She could be classified as a medical case until labor sets in, as she may have to be treated for vomiting, thyroid disfunction, various infectious diseases, heart trouble and the different kidney and toxemic conditions found at this time.

At soon as the child is born she becomes primarily a surgical case and must be treated and handled according to the principles of surgery; she may suffer from surgical shock, hemorrhage, tissue injury and infection.

The subject, Accidents of Labor, which has been assigned to me is therefore a surgical subject and the treatment must be along surgical lines.

The accidents of labor include most of the complications which are sudden and dramatic in their onset, and which may result disastrously if proper treatment is not promptly administered, and which, indirectly, account for most of the maternal deaths.

Time is too limited to take up all of the accidents of labor in detail, and so this discussion will be limited to a few of the most common and important ones.

A laceration of the birth canal is the most common accident. Lacerations of the vaginal walls and perineum are mentioned in passing only to emphasize the necessity of careful aseptic surgical repair. This will militate strongly against infection as a virulent streptococcic infection may enter through lacerations.

RECTAL TEAR

A third degree laceration into the rectum, however, is a serious accident, and on its proper treatment depends the patient's future comfort and possibly her life. It must be repaired accurately and at once if the patient's condition will allow.

To make a good repair a nearly bloodless field must be obtained. If the placenta has separated and can be expressed, this should be done, a hypodermic of ergot given, and a large laparotomy sponge packed in the vagina to control seepage from above. Active bleeding points should be tied and the situation surveyed. If the placenta has not separated I give 1.c. of pituitrin insert the pack as above alongside the cord and proceed with the repair while the placenta is undergoing separation. Someone must watch the uterus to detect accumulation of blood within its cavity. If active uterine bleeding occurs, the repair work is halted, the pack removed and another attempt made to express the placenta; if this fails and uterine bleeding persists a manual removal of the placenta is done, ergot given and the repair continued. Too much time must not be consumed as the patient may have a degree of shock from her delivery and a short anesthesia is desirable.

Mercurochrome is swabbed over the raw surface and two Allis forceps are placed at the edges of the rectal tear at the mucocutaneous border, the bowel straightened out by traction and the rent repaired by intestinal sutures of No. 0 chromic gut. Starting at the top a continuous suture is placed, endeavoring not to go through the mucous membrane of the rectum but only through the muscular coat. After this suture is tied at the lower end the next step is to secure the sphincter ani. Usually one end is protruding and the other end is retracted deep in its bed, because the rupture usually occurs in the lateral part of the muscle. The end of the muscle is secured by inserting an Allis forceps deep in the bed and pulling the muscle into view. It can be easily recognized because the fibers run transversely to the rectum. The severed ends are united with two or three interrupted No. 0 chromic sutures.

The next step is to bury the line of suture in the bowel by a continuous Lembert suture as is done in intestinal anastomosis. After this is done the tear in the vaginal floor is repaired with chromic No. 1 catgut and the perineal body reconstructed by wide sutures bringing the separated tissues together in the midline. The skin sutures are of silkworm extending widely to the sides into the perineal body and a silkworm gut

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

suture is finally placed at the edge of the anus, which includes the united edges of the sphincter. This is placed under guidance of a finger in the rectum.

the side of the tear and pulling the cervix the opposite way a good exposure is made. A laparotomy sponge rolled into a compact cylinder and inserted into the cervix and lower uterine segment will tend to keep the blood from the uterus out of the operative field. The placenta may be either expressed first or not according to the amount of bleeding.

Fig. 1. Episiotomy.

Fig. 2. Episiotomy repair.

Fig. 3. Episiotomy repair.

The patient is kept on a liquid diet for four days and the bowels moved by magnesium citrate and a sweet oil enema on the fourth day.

The success of the repair depends on the degree of asepsis maintained. The presence of the opening into the rectum makes this difficult but careful attention to detail and the free use of mercurochrome make the effort well worth while and often perfect results are obtained.

LACERATIONS OF THE CERVIX

The question often is discussed as to whether the cervix should be examined and repaired at once.

In normal spontaneous labors and in low forceps deliveries it is not my practice to expose and repair the cervix. After difficult deliveries the cervix should be inspected, particularly if there is bleeding which may be coming from a cervical tear.

In home deliveries with insufficient help and poor light I would be inclined to let the cervix alone as long as there is no undue bleeding.

Cervical repair is not so very difficult if proper exposure and visualization can be obtained. The first and most important step is to have some one press down on the fundus, thus bringing the cervix to the vaginal outlet. The anterior and posterior lips are then grasped with sponge forceps and gentle traction made downward. By placing a retractor in the vagina on

The first stitch of No. 1 chromic catgut is placed at the top of the tear. This will control most of the bleeding. Interrupted sutures are then placed about ⅜ to ½ inch apart. The cervix heals well and excellent results are obtained.

EPISIOTOMY

As a preventive measure against lacerations of the lower birth canal, excluding, of course, the cervix, there is nothing better in my opinion than an episiotomy. A central episiotomy for spontaneous labors after the perineum has become somewhat stretched and dilated by the descending head works very well. However if a central episiotomy is done before some stretching of the perineum has occurred the incision is liable to extend down to and often through the rectal sphincter.

In hard mid-forceps delivery a lateral episiotomy should be done, a deep incision being made before a tear occurs. This releases the pressure on all parts of the vaginal outlet and prevents tears and stretching of the tissues at the base of the bladder, injuries to the vaginal floor and tears in the rectum.

If the incision is accurately repaired a condition approaching a nulliparous outlet will be

found two months after delivery. However, the scar will be tender for some weeks.

HEMATOMA VULVÆ

This is a rather rare condition. The lesion consists of a rupture of a vessel in the vulva and in one of my cases this was no external tear.

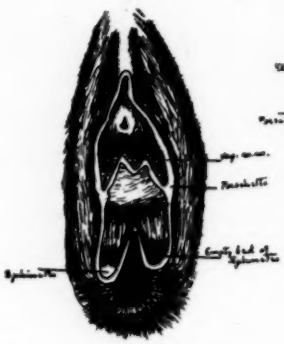

Fig. 4. Third degree laceration.

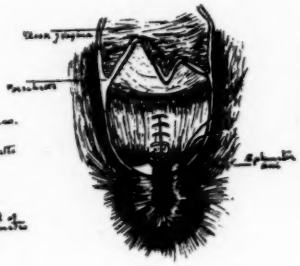

Fig. 5. Repair third degree laceration.

Fig. 6. Laceration of cervix.

The labor was spontaneous and nothing unusual was noticed at the time of delivery. About one hour later the interne phoned and said that the woman was in shock, with a weak thready pulse and clammy skin, and suffered severe pain in the vulva. He further reported that there was a large fleshy mass presenting at the vulva, which he said resembled the placenta a little which of course it was not. He said he had tried to remove it but couldn't. I went to the hospital and found a large hematoma one-half the size of a child's head with no sign of external tear. The patient was anesthetized, the hematoma opened, the blood removed and a bleeding vein found and tied. The patient was given some glucose intravenously and recovered rapidly.

ABRUPTIO PLACENTÆ

This serious condition is often associated with toxemia. The next most common cause is torsion of the uterus (Polak) with blocking of venous return. Polak says that taking the knee chest position three times daily during pregnancy has diminished the frequency of this condition, in his clinic. Direct trauma may also be a factor.

Symptoms consist of a sudden severe adbominal pain, usually with some vaginal bleeding. External bleeding is often a later sign. The pain is constant and the uterus becomes boardlike. Some shock is always present. In severe cases no fetal heart is heard. The symptoms may appear before true labor starts or in the early part of labor.

Treatment may be conservative or radical.

If the patient is a primipara with an undilated cervix and labor has not begun, my personal preference is for cesarean section. The uterus may be sutured and left if it contracts well and there is no bleeding, and if there has been no vaginal manipulation. Otherwise a hysterectomy should be done. Blood transfusion is very important and should be carried out if possible, otherwise glucose or acacia should be given intravenously.

Conservative treatment consists of morphine for shock, preparations for delivery, and rupturing the membranes. The cervix and vagina are packed with mercurochrome gauze and a tight abdominal binder applied. Three minim doses of pituitrin are given every twenty to thirty minutes. The blood pressure and hemoglobin are watched every half hour and a blood transfusion given. If labor is progressing all may be well. Delivery should be effected as soon as possible. After delivery the placenta is expressed or manually removed and it is usually wise to pack the uterus with mercurochrome gauze at once.

If however, under the conservative treatment, labor does not progress, the blood pressure and hemoglobin become quite low, and the general picture changes for the worse, section must be done. As there has now been considerable vaginal manipulation a hysterectomy must also be done. However, if conditions forbid operative treatment, good results often follow the more conservative method of treatment.

RUPTURED UTERUS

The uterus may rupture as a result of violent contractions in the presence of an obstacle preventing advance of the head or it may be ruptured by the efforts of the attending physician to deliver the baby.

After rupture has occurred, the only recourse is laparotomy preceded or followed by blood transfusion or glucose intravenously. If there has been no vaginal manipulation, it may be wise to remove baby and placenta and repair the rent, or it may be necessary to remove the uterus, de-

Fig. 7. Hematoma vulvæ.

Fig. 8. Rupture of uterus during version.

Fig. 9. Abruptio placentæ.

The first type, as a result of violent contractions, often following the administration of pituitrin, is usually preceeded by tetanic contractions and often a Bandls contraction ring is present. If the uterus completely relaxes between pains, even if they are very strong, there is not much danger of a rupture. This type probably does not occur all at once and at the first slight tearing the uterus becomes irritable and becomes tetanically contracted. The succeeding hard contractions occurring on top of the tetanic contraction completes the rupture. This type usually ruptures through the body of uterus into the general peritoneal cavity. After complete rupture occurs the contractions cease, the presenting part, if not fixed in the pelvis, recedes and the patient manifests the usual signs of shock. The contracted uterus may be felt alongside the fetus in the abdominal cavity.

In the presence of symptoms suggesting the imminence of rupture, the uterus should be given a rest by a dose of morphine or if the symptoms are very marked and the morphine does not have the desired result, the patient should be anesthesized and preparations made for instrumental delivery, embryotomy or cesarean section. Version should not be attempted under these conditions.

pending on the location of the rupture and possibility of infection.

The other type occurring during the course of operative delivery generally occurs during a version or it may occur during a forceps delivery through a poorly dilated cervix, the cervical tear extending up into the lower uterine segment.

The greatest safeguard against rupture of the uterus during a version is a perfectly relaxed uterus, if the bag of water has long been ruptured and the uterus is tetanically contracted or a contraction ring is present, version is difficult and very dangerous. Deep anesthesia is essential, either by chloroform or ether. Ethylene is not sufficient to relax the uterus and all manipulations must cease during the slight contractions which occur even during anesthesia.

A rupture of this type is usually in the lower segment and often into the broad ligament as in the illustration. There is generally profuse hemorrhage, the uterus contracts poorly and the patient at the conculsion of the delivery is in shock. With these symptoms the interior of uterus should be explored at once to rule out rupture.

In one case seen, the attending physician gave a history of delivery by version of a live baby, profuse hemorrhage and considerable shock. The

patient was in poor condition all the time following delivery and nearly every day a rather brisk bleeding occurred. Several blood transfusions were given. When I saw her six days later there was a hard mass in the left lower abdomen separate from the uterine body, extending high up toward the kidney region and the patient was in bad shape. A diagnosis of rupture into the broad ligament behind the peritoneum was made. She did not seem to be in a condition to withstand a laparotomy and so she was anesthesized and the uterus explored with the findings as illustrated. A large blood clot was removed and the cavity packed; it was impossible to identify any bleeding artery although it was surmised that the uterine artery had been torn. However, the packing failed to check the bleeding and the patient died eight days after delivery.

An autopsy was obtained with the findings as illustrated. Note that the cervix itself was not torn. At autopsy it was very difficult to identify the torn uterine artery, so great was the infiltration with blood. This supported our opinion that laparotomy was not advisable as the operation would have been long and difficult.

In conclusion I only want to emphasize the fact that the results you will obtain in treating the accidents of pregnancy will depend on your previous conduct of the case. If labor has been conducted in an aseptic manner with no vaginal examinations and your patient has not been infected, the results will be fairly satisfactory. If on the other hand there has been much manipulation and the patient has been infected the accidents of labor will result disastrously.

DISCUSSION OF PAPERS BY DRS. BERGHEIM, MUSSEY AND MANLEY

Dr. J. C. Litzenberg (Minneapolis): This is one of the proudest moments of my life for the reason that the exhibit this morning is a testimony that in Minnesota conservative obstetrics is practiced. You have learned from this symposium this morning one of the reasons why the maternal mortality in Minnesota is lower than in any state in the Union.

You have heard specialists discuss various phases of the subject, and you have also heard a country doctor read a paper which is worthy of any specialist and which shows why our maternal mortality is being reduced in Minnesota until it is now the lowest because maternal mortality is not reduced by specialists but by the general practitioner.

The work of Dr. Berkwitz is of special significance in the question of what occurs in the early toxemias of pregnancy. There has been too much emphasis placed upon the toxic character of the vomiting of pregnancy. Much of the early vomiting of pregnancy is due to neurosis and should be treated as such. However, if we cling to this idea too tenaciously with a one-track mind, just because a majority of the cases are not toxic, we are liable to fall into error as Dr. Berkwitz's paper has proven.

It is unfortunate that so many of the patients that Dr. Berkwitz has reported, died. One of them died under my hands on the table because we did not see her early enough to recognize the toxic nature of her condition and to empty the uterus. The lesson in this is that when patients do not respond to the usual treatment for vomiting of pregnancy, they must be assumed to be toxic and the uterus emptied in time to save the patient. Of course, a good many of them come into our clinic in rather a severe condition. But I think the lesson of this is that the vomiting of pregnancy, the early vomiting of pregnancy, may be toxic, and the patient may lose her life. These patients, if they do not respond to the ordinary treatment, should be promptly aborted.

One of the reasons I feel so proud of this program this morning is that it is a prophylactic program. Every one of the speakers has emphasized the necessity of prophylaxis, and they are bringing into the picture the necessary emphasis which should be placed upon postpartum as well as antepartum care. In other words, they have emphasized, particularly Dr. Mussey, Dr. Bergheim and Dr. Barry, the necessity of following these women in after-care, not only until a woman is delivered of a healthy, living baby, but that woman must be followed until she is restored to perfect health.

Dr. Barry has emphasized the postpartum care, because of the consequences, immediate and remote, of puerperal infections.

When we realize that we have endocarditis, peritonitis, abscess of the lung, nephritis, following the toxemias of pregnancy and following the infections of delivery, we may then lay emphasis on the postpartum care, which means that the woman should be watched until she is restored to perfect health.

Dr. Manley emphasized the necessity of prophylaxis in the accidents of labor, because many of these accidents can be prevented. I was glad to note that he took such a sane position. That word "sane" is a favorite of mine, because I don't exactly like the word "conservative" because one is apt to think that the conservative is the man who does nothing.

I think the late Dr. J. E. Moore described a conservative in the best words that I have ever heard when he said: "A conservative is the man who knows when and how to be radical."

These men you have listened to this morning are

possessed of skill to do any of the radical procedures of obstetrics, but their sanity keeps their feet on the ground.

I was particularly pleased with the figures that Dr. Mussey presented, because you know that we have been going through two particular things in regard to the toxemias of pregnancy which have considerably disturbed us.

About twelve years ago from Williams' Clinic came a paper which said that the women who have had eclampsia or toxemia are no more liable to have subsequent attacks (and the figures even showed a lesser liability) than the women who have not had it. We have also been going through a discussion among the pathologists. "Is the condition of the kidney with which we deal in the toxemia of pregnancy, a nephrosis or a nephritis?" We have been deceived by the large number of women who apparently completely recover from their toxemias of pregnancy.

In the marvelous symposium on the kidney, which was held at the University last summer by men from all over the world who had made special studies of the kidney, the idea of nephrosis was very vigorously combated. If those who advocate the idea of the nephrosis are compelled to surrender to the idea that this thing with which we deal, as far as the kidney is concerned in the toxemia of pregnancy, is a nephritis, then Dr. Mussey has the explanation of the figures which he presented. They are rather striking.

Let me say just one word about so-called recurrence. I doubt if this is a true recurrence of a preeclampsia. I think it is symptomatic recurrence because the kidney is damaged. I have had a theory. You know, a theory is something which you figure out more or less from a philosophical standpoint, but data for which does not exist for its absolute proof. My theory has been this, that whether a woman has trouble in a future pregnancy, when she has had a previous toxemia, depends upon the amount of damage done to her kidneys during her toxemia. I believe this is logical. I admit it is only a theory, but Dr. Mussey brought a very great deal of proof of it in his paper this morning.

Dr. Mussey emphasized the necessity of prophylactic care for these women. I know of nothing in the practice of obstetrics that needs postpartum care more than to follow every woman who has had a toxemia, by observation and treatment until she has returned to absolutely normal health; in other words, until the albumin has all disappeared, until her high blood pressure has disappeared, but that is not all—until we know that her kidneys are functioning properly. Even then we cannot be assured that she will not have a recurrence later on, because if my theory be true that whether she has subsequent atacks or not depends upon the amount of damage done to that kidney, even then she may have recurrence, because we all know that the human kidney is four or five or maybe more times greater in functional tissue than is necessary to preserve life. Therefore, a kidney may be considerably damaged so that the woman may go on to good health and live out her life expectancy if an additional burden be not thrown upon those kidneys, which is done by a subsequent pregnancy. Therefore, when this subsequent pregnancy throws that extra burden upon the kidney, the damaged, although apparently healthy, kidney is found to be insufficient.

I have left the discussion of Dr. Bergheim's paper to the last for the reason that he is the one who exemplifies the general practitioner in Minnesota. There are men like him all over this state who are practicing sane obstetrics. We specialists in the Twin Cities who are so proud of our practices do not have more patients in obstetrics than Dr. Bergheim has out in a village of 1,000 people. He is practicing that thing in the country which we as teachers have preached for years. When we talk about this prenatal care and this care during labor which Dr. Barry emphasized, and the postnatal care which particularly Dr. Mussey has emphasized, many country practitioners say: "You don't know anything about it. You are nothing but a city guy and a teacher." You won't listen to me; I don't blame you much. Nevertheless my early practice was in a labor Ward of Minneapolis. If there is anything worse in the country than the things I met in city practice, when I had to sleep on the fuzzy side of a rug and often on the soft side of a pine board during the night, I should like to know it. Nevertheless, I admit I am from the city and I am only a teacher. But Dr. Bergheim and men of his type all over this state are practicing sane, complete obstetrics in the country and I believe that is the reason that the maternal mortality in Minnesota is lower than any state in the Union.

ALLERGY AND PNEUMOCOCCUS LOBAR PNEUMONIA*

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Minneapolis

THE discovery of anaphylaxis and its relation to protein intoxication has been followed by numerous efforts to draw an analogy between this phenomenon and the manifestation of certain acute infectious diseases. At present it appears that allergy or hypersensitiveness to bacterial protein plays an important rôle in tuberculosis, syphilis, acute rheumatic fever, and probably in acute nephritis. The suggestion that lobar pneumonia as a disease represents a form of allergic or anaphylactic reaction was made by Friedberger and by Rosenow in 1911. Certain features of lobar pneumonia, such as the sudden onset with chill and fever and the sudden drop of the fever, resemble the reaction which often follows the injection of foreign protein in an experimentally sensitized animal. Numerous attempts have already been made to demonstrate the presence of allergy in humans and in experimental animals by employing skin tests, using the pneumococcus or its products as antigen. Varying degrees of success have been attained.

Interest in the subject of the allergic nature of lobar pneumonia has been recently renewed, chiefly through a series of publications by Lauche[1, 2, 3] and by the decisive experiments of Avery and his associates[4, 5] concerning specific anaphylaxis with the pneumococcus and its products. Lauche approaches the subject by comparing the difference in the reaction of young infants as compared with adults to pneumococcus infection. He points out that infants less than four months of age seldom contract pneumococcus lobar pneumonia, and that when infection does occur, it is mild. The explanation for the difference in response in infants and adults assumes that infants have not as yet had the opportunity to become sensitized to the pneumococcus, and thus do not react in a violent, anaphylactic manner when exposed to an infecting dose of pneumococci. With increasing age, opportunities for contact with the pneumococcus increase in proportion. Numerous mild infections, for example, sinusitis, mastoiditis or conjunctivitis, may occur in early childhood and later, which eventually induce a state of hypersensitiveness reaching its height in adult life, at a time when lobar pneumonia is most common and most severe. It is Lauche's contention that pneumococci invade the lung tissue of a sensitized individual near the hilum or the adjacent lymph nodes, where the first inflammation and bacterial growth occur. The inflammatory reaction at the hilum obstructs the lymphatic drainage of the lobe and induces a back flow of lymph toward the periphery. By this reversal of lymph current, favored by the sparseness of valves in the lymph channels, pneumococci or their products (antigen) are distributed throughout the lobe. The distribution of antigen throughout the lobe can probably also be accomplished by the normal ebb and flow current of the pulmonary lymph stream. When the concentration of antigen in the sensitized lung attains the stimulation threshold (Schwellenwert), the explosive anaphylactic reaction manifested by the sudden chill, fever and outpouring of exudate occurs. The height of the threshold depends upon the degree of sensitivity. Lauche's theory is attractive and has considerable experimental data to support it.

Soon after Friedberger suggested the allergic nature of pneumonia, both he and Schittenhelm[6] succeeded in producing sterile anaphylactic pneumonia in sensitized guinea pigs by the introduction of the shocking dose of protein into the lungs. Ishioka's histologic studies[7] demonstrated that in many instances the histologic picture of the pneumonia produced in this manner closely resembled that of a lobar pneumonia in humans.

As early as 1904, before allergy was considered, Wadsworth,[8] in endeavoring to induce pneumonia in rabbits by intratracheal injection of pneumomoccus cultures, noted that inflammatory localization in the lung occurred only in those animals which had previously been immunized. Otherwise the rabbits would either remain well or would promptly die from pneumococcus septicemia. Twenty years later, Stillman and Branch[9] noted the same requirement necessary to produce pulmonary localization of pneumococcus infection in experimentally infected

*From the Medical Service, University Hospital, Minneapolis.

mice, namely, that pulmonary inflammation occurred only in mice which had previously been partially immunized. Normal unimmunized mice promptly died from an overwhelming generalized infection. Although Wadsworth, and Stillman and Branch considered partial immunity as one of the chief factors determining the pulmonary localization of infection, it appears now that the state of hypersensitivity must also be considered.

Sharp and Blake[10] have recently reported experiments similar in nature to those of Friedberger, Schittenhelm and Ishioka. They have found that pneumococcus autolysates elicit an acute exudative inflammatory response when injected intratracheally into the lungs of specifically sensitized rabbits. Similar intratracheal injections in normal (non-sensitized) rabbits failed to incite any pulmonary reaction. In other words, the inflammatory reaction in the lungs in response to the contact with pneumococcus autolysate depends upon the specific allergic state of the animal. It was also found that a fairly close parallelism exists between cutaneous and pulmonary hypersensitiveness to pneumococcus autolysates in the rabbit.

Important observations have also been made concerning the relation between immunity and pneumococcus infections in humans. Clough,[11] and Robertson and Cornwell[12] have shown that many normal individuals possess demonstrable immune bodies in their blood. Furthermore, Robertson, Terrel, Graeser and Cornwell[13] have shown that individuals with demonstrable specific immune bodies in their blood serum may contract lobar pneumonia. They explain this apparently paradoxical fact by assuming that local changes take place in the lung, of such a nature as to provide conditions for the growth of pneumococci, while at the same time protecting them from the bactericidal action of the immune bodies in the blood. However, another explanation is possible, as the latter investigators also suggest, namely, that allergy may play a rôle. The demonstrable antibodies were probably provoked by previous mild pneumococcus infections, and it is possible that these patients are both partially immune, and hypersensitive as well.

Avery and Tillett[4] have shown that anaphylactic shock can be induced by the injection of small amounts of type-specific carbohydrate derived from pneumococci in guinea pigs passively sensitized with homologous antipneumococcus rabbit serum. Tillett and Francis[5] and Kramár and Gyüre[14] have shown that specific skin reactions characterized by urticaria-like wheals, may be obtained in pneumonia patients after the crisis at the site of an intradermal injection of pneumococcus carbohydrate. The cutaneous response when obtained was always elicited by the carbohydrate homologous to the type of pneumococcus which caused the infection. The skin sensitivity was found to parallel the presence of circulating type-specific antibodies. The presence of sensitivity was, however, independent of the presence of type-specific antibodies; in other words, immunity and hypersensitivity are not identical. The independence of pneumococcus immunity and allergy has been further demonstrated by Rich and Brown.[15]

Comment: There are at present, therefore, a number of facts and theories in regard to the allergic nature of lobar pneumonia:

1. Anaphylactic pneumonia has been produced experimentally.
2. It is usually necessary to use animals which have previously been exposed to pneumococci before pneumococcus lobar pneumonia can be produced experimentally.
3. Specific skin hypersensitiveness is demonstrable in patients after an attack of lobar pneumonia.
4. Individuals with circulating specific immune bodies may develop lobar pneumonia.
5. The theoretical consideration of Lauche explains the mildness of lobar pneumonia in young infants on the basis of a lack of hypersensitiveness.

Although a number of factors seem to indicate the importance of hypersensitivity in lobar pneumonia, others suggest that hypersensitivity is not alone responsible for the characteristic reaction. Lobar pneumonia may on rare occasions occur in very young infants, who, according to Lauche, are not yet sensitized. Under these circumstances the pneumonia often runs a mild course and probably involves factors of immunity only. Non-immune infants, like highly susceptible experimental animals, often die from an overwhelming septicemia without pulmonary localization. In many adults lobar pneumonia commences rather insidiously, without manifestations of the prompt allergic reaction characteristic of hypersensitivity. It is possible, however, that these atypical manifestations may only indicate

the varying intensity of the two factors of immunity and hypersensitivity, and that under certain circumstances one or the other may condition the response. Hypersensitiveness does not appear to play any rôle whatever in the production of experimental pneumonia in monkeys (Blake and Cecil[16]) or in dogs (Terrell and Robertson[17]).

There are obviously many facts to be discovered before the exact relationship of hypersensitivity to pneumonia is established, but there are many indications that the allergic state may, at least, have some influence and may modify the response to infection to some extent. The question arises as to the subtle equilibrium which apparently exists between immunity, hypersensitiveness and infection. What part do the commonly recognized predisposing factors play? Do they diminish immunity and permit the invasion and growth of pneumococcus and subsequent contact of these organisms or their products with a hypersensitive lung? Is immunity decreased or is hypersensitiveness increased, or are both factors involved? Does the supposed predisposition of one attack of pneumonia to subsequent attacks depend upon a continual hypersensitive state or are individuals who have repeated attacks of lobar pneumonia unusually hypersensitive or unusually non-immune?

SUMMARY

A recent theory regarding the pathogenesis of lobar pneumonia as advanced by Lauche, regards allergy or hypersensitiveness to pneumococcus as an important factor. The mechanism of infection operates as follows: pneumococci invade the lung tissue or the bronchial lymph nodes of a sensitized individual. The first inflammation occurs near the hilum, from whence pneumococci or their products (antigen) are distributed throughout the lobe which drains into the area, by means of the reversal of the lymph stream. When the concentration of antigen attains the stimulation threshold, the sudden inflammatory exudative reaction of lobar pneumonia occurs.

Other experimental data published by numerous investigators further suggest that pneumococcus lobar pneumonia is conditioned in part, at least, by a state of allergy or hypersensitiveness of the individual to the pneumococcus.

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VINCENT'S DISEASE*

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BY VINCENT'S DISEASE I mean an infection caused by the fusio spirochetal organism of Vincent. It is usually located in the mouth, but it may be found in any part of the body. The disease may be acute or chronic; it is infectious, and it may cause death.

At the present time Vincent's infection is of greater interest than ever before because the disease is decidedly on the increase and has been since the Great War.

We may well ask, what is the reason for such an increase? Is it not a fact that besides the congestion and the increase in the prevalence of the general infections, there must be carriers, people chronically infected who are not recognized as such and who are disseminating the disease?

Mucous membrane contact with infected material, usually saliva, is the common method by which the disease is contracted. Coughing, unclean dishes, cigarettes, pipes, dental instruments, as well as kissing, may be factors.

In 160 individuals Miller found the organism in 77 per cent; Brams discovered its presence in the crypts of 82 per cent of 100 pairs of tonsils. It has not been present in the mouths of edentulous people, and we have rarely found it in what we have termed normal mouths. It is probably an opportunist acting in a secondary role—more saprophitic until some conditions arise which lower the resistance of the local tissues, such as: erupting third molar teeth, pyorrhea, receding gums, pre-existing pockets, cavities that are not easily accessible to the tooth brush, faulty dentistry, unclean mouths, tobacco, mercurial stomatitis, also the associated diseases such as adenoids, diphtheria, measles, syphilis, scarlet fever, purpura, sepsis, diabetes, tuberculosis, malnutrition, scurvy, and malignant growths; then the organism may grow and become the dominant cause of the pathological condition.

To quote from Tunnicliff: "The fusiform bacilli and the spirilla with which they are always associated are different forms in the life cycle of one organism.

"The organism is an obligate anerobe; it grows at 36 degrees C. but not at room temperature. A slightly offensive odor is given off in successful cultures. The bacilli are non-motile and insoluble in 10 per cent saponin or bile.

"Cultures were made anerobic according to Wright's method, by saturating the cotton stopper with a 5 per cent solution of sodium hydroxide, a piece of pyrogallic acid the size of a pea having been placed on the plug; the tube was closed with a cork and sealed with paraffin.

"The colonies on blood agar are whitish with a slightly violet tinge, smooth and moist, edges regular, from 1 to 3 mm. in diameter. In ascites agar shake cultures, the colonies are lenticular with even borders, and are slightly brownish. When well separated, they may become larger. A puff-ball appearance of the colonies has not been observed.

"The organisms grow well on Loeffler's blood serum, autoclaved rabbit brain, 1 per cent dextrose broth, distilled water and ascitic fluid 1:3, plain and dextrose broth with ascitic fluid 3:1, plain and dextrose agar to which blood or ascites fluid has been added in the proportion of 3:1. It requires some body fluid for growth, but enough may be carried over on inoculation for one generation. In dextrose broth the growth is diffuse at first, later settling into clumps; in other fluid mediums it is flocculent. Cultures were also successful on blood agar and in ascites broth, to which were added solutions of either 5 drops of 20 per cent sodium chloride solution, 1-2 drops of 10 per cent sodium hydroxide or 1-2 drops of 10 per cent acetic acid to each 5 c.c. of medium. Larger amounts of these substances generally inhibited growth. The addition of fresh rabbit kidney tissue did not appear to enhance the growth. The hydrogen-ion concentration of the medium was 7.4 to 7.6.

"The bacillus ferments lactose, dextrose, salicin and inulin, but not mannite, maltose, or saccharose."

Veillon, Zuber, Weaver, and Tunnicliff on injecting pure cultures subcutaneously into animals produced local abscesses. Smith injecting sputum into the groin of guinea pigs produced

*Read before the Minnesota Society of Internal Medicine, Minneapolis, April 13, 1931.

local abscesses at the point of injection, and metastatic abscesses in the liver, spleen, and lungs. The same combination of organisms was present in the metastatic abscesses as in the original sputum. By inoculation into the groin of other animals the disease was transmitted from guinea pig to guinea pig at ten day intervals for five passages. Pus from one of these pigs was inoculated in 0.25 c.c. amounts into the tracheas of four rabbits; two died of pulmonary gangrene and two of pulmonary abscesses associated with empyema.

The bacilli appear as pointed, straight, or curved rods 2-10u in length. The spirilla appear as straight or curved forms with 2-8 curves and from 3-10u in length. They stain well with gentian violet and carbo-gentian violet. We have used the gentian violet in our work. A platinum needle is applied to the suspected areas; the material obtained is spread on a clean glass slide, dried, and fixed in heat; the stain is then applied, washed, dried, and examined under an oil emersion lens.

On routine examinations we have been finding for some time patients with the soft parts about some teeth swollen; the margins have been very red and have been slightly separated from the teeth. These parts might be covered in part or whole by a greyish exudate; ulceration has usually not been present, the breath has had an unpleasant odor, and in the mild cases there have been no constitutional symptoms. These people were sent to their dentist for care. In some cases a diagnosis of gingivitis or pyorrhea was made; mild treatment was given. We were surprised to see that these people did not improve.

What was this condition? Was it a local infection in the mouth, a local manifestation of a general infection, a deficiency disease, or a general blood disease? The routine physical examination had been made and the laboratory examinations which included: complete blood, blood metabolites plus calcium, platelets, bleeding and clotting time, Wassermann and Kahn, urine, and gastric secretions. X-rays of the teeth were made. We then added to our routine the examination of smears made of the material obtained from the suspected teeth. In our first 100 cases which presented the above picture we found that 98 per cent showed large numbers of the Vincent organisms. Since that time we have found 100 per cent positive smears.

The patients are sent to their dentist with a diagnosis of chronic Vincent's infection and a combined treatment is administered. We are now getting results.

Coöperating with the dentist, the doctor should see that the patient is in the best possible physical condition. A liberal general diet should be given avoiding condiments, pickles, and highly seasoned and coarsely divided food. Smoking, and the use of tooth picks and dental floss should be avoided. The dishes and towels should be isolated. The patient should be instructed to cover his mouth whenever he coughs or expectorates. Any sputum should be burned.

The dentist, on his part, should employ a regime of mild instrumentation and cleaning the tissues, avoiding any trauma and procedure that might lower the resistance of the soft parts which would make a nidus for any organism. In addition we like to use a mouth wash composed of equal parts of alcohol, peroxide and glycerine, which may be used as a spray about the teeth. A thick perborate paste may be used locally. Cleaning the teeth with a soapy tooth paste aids in removing the organism. Should there be extensive infiltration or involvement, a local application of a 10 per cent solution of salvarsan may be applied.

It will require several days before the soft parts will have a healthy appearance. It is at this time that corrective dentistry should be started. This is most important as the future condition of the patient's mouth rests upon the treatment by the dentist, i.e., cleaning the mouth and teeth, and correcting any abnormal condition. This will insure the patient against recurrence once a cure is effected.

In any mouth in which Vincent's infection is present, it is dangerous to extract teeth or perform any surgical operation about any part of the body until the infection is controlled or cured.

The case of one man is instructive. He had had an infected mouth which had been treated in the East. Upon his return to Minneapolis, a chronic recurrent appendix became acute; his mouth seemed to be clear but no smear was made at this time. The appendix was removed; his condition following the operation remained normal for two days, when following a slight chill his right and then his left parotid glands swelled. The swelling increased so that his face appeared to be round; his temperature was 104°; he was

delirious; one of his finger joints was swollen and painful; a thick yellowish-green material could be expressed from Steno's ducts. The cultures and smears were said to contain only the usual pus producing organisms. The patient died.

Within a short time another man came to see us because of a swollen jaw. We found him with a high fever and his right parotid gland was badly swollen. The soft parts about the upper and lower teeth on the right side appeared as described above. The smears made from the material from Steno's ducts were examined immediately and were found to contain large numbers of Vincent's organisms. A diagnosis of Vincent's infection was made and four days later, following proper local and general care, the man left the hospital with no symptoms and the gland nearly resolved.

Another case is that of a man who had been sick two days, delirious, with a high temperature. He had a facial erysipelas involving the nose, cheeks, forehead, eyes, ears, and neck. The mucous membrane about the teeth was very red and covered in some areas by an exudate; his breath was foul. Smears showed the presence of large numbers of Vincent's organisms. He was taken to the hospital, the erysipelas was treated by X-ray, neo salvarsan was given to him intravenously and was used locally in his mouth. His dentist coöperated in the treatment, and the patient made a splendid recovery.

The sinuses and bones of the head are frequently infected by Vincent's organisms, and from these areas nearly every part of the body may be infected. Osteomyelitis, meningitis, brain abscesses, chronic otitis, media abscesses and gangrene of the lungs, pericarditis, ulcers of the stomach or rectum, abscesses in the glands or any viscera may be caused by Vincent's organism. In fingers infected from biting the nails, and in the intrauterine secretions following abortions, Vincent's organisms have been found.

In the acute Vincent's infections there is an abrupt onset with chills, fever, weakness, general aching, and local symptoms such as burning, pain, salivation, dysphasia, tender teeth and swollen submaxillary glands. The red swollen soft parts about some or all of the teeth will be seen with the red infiltration extending locally or generally through the mouth into the pharynx, covered by an exudate and a local or generalized ulceration. A diagnosis is easily made in the chronic form. The appearance, with the positive smears and culture, identify Vincent's disease.

The infection should be recognized and proper treatment instituted early before destruction of the tissues occurs. In this case the prognosis is excellent and the treatment of the disease is short. Where tissue destruction is present, the infection is difficult to manage and the treatment will be prolonged.

If the dentist and physician coöperate in recognizing and treating Vincent's disease, great headway will be attained in the stamping out of this disease which is becoming more and more prevalent.

THE FOUNDING OF THE RAMSEY COUNTY MEDICAL SOCIETY*

JOHN M. ARMSTRONG, M.D.

Saint Paul

SIXTY-ONE YEARS ago this month the Ramsey County Medical Society was born. The minutes of the first meeting and in fact the minutes of every meeting since, are intact and in our possession. Those physicians in actual attendance at the initial meeting were as follows: D. W. Hand, A. Wharton, Wm. Banks, C. W. Boardman, S. D. Flagg, E. H. Smith, John B. Phillips, Wm. Ray, Samuel Willey, Frank Lawson, and Adelard Guernon. In addition to these the following were admitted as charter members: Thomas R. Potts, David Day, A. G. Brisbine, J. H. Stewart, Franklin R. Smith, John Steele, J. H. Murphy, Brewer Mattocks, Chas. E. Smith, Martin Hagan, and William Baldwin.

Their portraits may be seen grouped together on our Library walls. Unfortunately these portraits were collected many years after the event of our founding, and in most cases portray these men much older than they were in 1870. You will note on reading the minutes of the first meeting that the Society considered itself a reorganization of the St. Paul Academy of Medicine and Surgery.

In 1901 when Dr. Boeckmann read a history of our society as his retiring presidential address, he was able only to state that in our library was a minute book of this older organization of physicians with the minutes torn out. All that was known about the Academy was the names of the members which were written on the inside of the front cover. Dr. Boeckmann expressed the hope that at some future date the missing pages might be found, a hope not yet fulfilled.

Nevertheless research has given us much information about the Academy. It was organized March 1, 1860, its membership consisting of twelve men as follows: T. R. Potts (Pres.), A. G. Brisbine (V. P.), A. Wharton (Sec), John Steele (Treas.), Samuel Willey, J. H. Stewart, F. R. Smith, J. A. Vervais, Wm. H. Morton, E. Braun, Francis Reiger, and D. W. Hand; practically the same who were the majority of the founders of our society. We have accomplished much in the past sixty years, but the older society also accomplished a great deal in the six years of its activity, and no doubt the ideal for which the older society strove was the ideal kept in view when our present society was established, though we have been slower in our progress.

To those of you who think our present dues too high, I might mention the fact that the dues of the Academy were twenty-five dollars a year, and none of it was paid to the State Association, which did not then exist. The Academy maintained "two gas lighted rooms on Third Street, above George Benz Beer Saloon," had a chemical laboratory, an electrical machine for physiological experiments, and owned a compound microscope of the best make obtainable at that time. It is stated that when the scientific meeting adjourned a social meeting often continued downstairs.

The Chicago Medical Journal for June, 1861, in an editorial about the Academy, states, among things highly complimentary, that at the end of the year the receipts were $620.72, expenditures $462.93, and a cash balance to date of $367.07. You may wonder where all this money came from. On April 15, 1860, we find that the newly formed Academy petitioned the City Council of St. Paul, in a letter signed by Doctors Potts, Brisbine, and Wharton, that their president, Dr. Thomas R. Potts, be appointed city physician. The council thereupon elected Dr. Potts city physician for one year. The emolument of this office was five hundred dollars per year. The twelve members of the Academy then took turns of a month each, acting as city physician, and turned in the salary to the Academy. It is needless to say perhaps that the war between the states was the cause of the demise of the Academy. Of its twelve original members, nine served their country in the army during the years 1861-1865.

When the conflict was over, Morton was dead.

*Read before the Ramsey County Medical Society, St. Paul, February 27, 1931.

Braun had gone to Little Falls and Vervais had dropped out, and Rieger was leaving St. Paul. Thus but seven of the original members remained, though Doctor Mattocks was admitted to membership in 1865. The remaining members, feeling that they alone could not carry on, and being unable to determine the ethical and professional status of the new members of the profession who flocked into St. Paul after the war, were placed in a quandary. In addition, their articles of incorporation made them rather a close group and were inelastic enough to meet the situation. So a meeting was called by Dr. Brisbine, who was then president, the laboratory equipment and apparatus sold, the books in the library returned to the donors, and the remaining funds expended on a rather elaborate banquet, and the Academy "liquidated and dissolved." This was in 1866. During the four year period from then until 1870, informal medical meetings were held to which others than those formerly belonging to the Academy were invited. When the present State Medical Association was formed in 1869, the physicians of Ramsey County felt that the time had come to organize again, and the suggestion of Dr. Hand that it be called the Ramsey County Medical Society, prevailed. The status of the physicians of the country was then pretty well known, and our present society was formed on February 14, 1870. Who took the initiative in its formation remains in some doubt. It is certain that the remaining members of the Academy were somewhat apathetic as to starting a new society. The active organizers probably were Drs. Boardman, E. H. Smith and Flagg, urged on by Dr. Willey, who at this time was too far gone with tuberculosis to take an active part in the organization, though he was one of the active organizers of the State Society the year before. The first meeting was held in Dr. E. H. Smith's office, with Dr. Willey acting as temporary chairman until the officers and committee of organization were selected. It may be interesting here to relate the history of the seal of our society. This can best be done by quoting a letter written by Dr. Brewer Mattocks under date of October 3, 1914. Dr. Mattocks is our sole surviving charter member, and we hope will be with us tomorrow. He states: "As to the Seal of the Society, we had none until I was elected to an honorary membership on my return to St. Paul (about 1900) when I was, with the remaining charter members, Drs. Flagg, C. E. Smith and Wharton, appointed to secure the pictures of the charter members. It then occurred to me that we should have a seal, and I suggested the microscope, the pen and the scalpel with the legend dissect, observe and write, in the imperative. I wrote to Bishop Ireland to latinize the motto for me. He was kind enough to send his secretary to me with the suggestion that the imperative be changed to the infinitive, and wrote the legend as it now stands. Drs. Flagg, Smith, and Wharton united with me in presenting this seal to the society, which was graciously accepted as such, and no questions asked from the surviving charter members."

I may say, in addition to this, that the design was drawn by R. O. Sweney. No doubt many of our older members remember Sweney's Drug Store on what used to be called Bridge Square (Third and Wabasha streets).

THE RAMSEY COUNTY MEDICAL SOCIETY'S LIBRARY*

A SHORT HISTORY AND A DISTINGUISHED SERVICE RECORD

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Saint Paul

THE SUBJECT I am to talk about this evening is one that recalls many delightful personal reminiscences, and which I most sincerely hope will please you in the telling.

The library of the Ramsey County Medical Society is now thirty-five years old. It is still growing vigorously, with every promise of a middle age whose service to the local practitioners of medicine should prove to be one of ever increasing usefulness.

We will first consider its birth and infancy, the most important period in the records of every living organism.

" 'Tis fortune gives us birth.
But Jove alone endues the soul with worth."

Dr. Jay Owens in 1883 offered the exchanges of the Northwestern Lancet, of which publication he was editor, to the Ramsey County Medical Society as the nucleus of a library. Unfortunately nothing happened.

At the annual meeting of the Society in January, 1895, the retiring secretary, Dr. H. Longstreet Taylor, made a plea that the Society found a reference medical library, and outlined a plan for its foundation and support.

Dr. A. B. Ancker, presiding, appointed, as a committee to consider the suggestion, Drs. Millard, Renz, Ohage, Foster, and Taylor. After much deliberation it was decided to establish a loan library by providing a room and borrowing reference works from the members of the society, which were to be properly housed, catalogued and made accessible to all searchers after medical truth, and also were to be returned to their owners upon demand. Lest we should forget this last clause, allow me to digress a moment to state that every one of the hundreds of volumes collected in this way is still on our shelves, while, I am sorry to say, very few of the generous lenders are with us today.

A library association was formed, with Drs. Rothrock, Dunning, Eduard Boeckmann, Auten Pine and Taylor as directors. Two rooms were secured for the library and a laboratory in the old Lowry Arcade, which space was given up for quarters in the top of the new Lowry in 1912, when history, as is her wont, repeats once more, and today we move into these palatial quarters in the newest Lowry Building, now known as the Lowry Medical Arts Building.

In the beginning, funds were supplied by the donations of the members, and books and medical journals were solicited on all hands. One of the Board made a practice of spending Saturday afternoons with an express man and his wagon, going to the residence of any physician who would give his permission, and there, with the very willing consent and approval of his wife, would go through the attic or storeroom and cart off everything in the way of medical books and journals that had gradually been crowded off the book case shelves and had finally been consigned with other dust catchers to these regions. These forays often yielded very large dividends, sometimes in unusually valuable books or a first edition, or a rare print, but always in back numbers of periodical literature, which eventually, in combination with donations of others, supplied the missing gaps required to yield complete volumes of the leading medical journals. When these complete volumes finally ran back for five, ten, or even fifteen years and began to fill the sections allotted to them, the triumphant joy of the bibliophilic collector was experienced by the members of the committee. Personally I look back upon the evenings spent with these express wagon loads of treasure, oftentimes in the congenial company of Eduard Boeckmann, sorting over the spoils of the latest raid until the wee small hours. He and I once spent a week-end in the southern part of the state, at the home of a prominent physician, recently deceased, and added a large shipment of Scandinavian literature to the library. We left the house at dusk Sunday evening in a one horse buggy, with Dr. Boeckmann driving. It soon began to rain and grew very dark. It seemed as though we were alone in the thick fog and rain,

*Read before the Ramsey County Medical Society, Saint Paul, February 27, 1931.

as no travelers met us, no friendly lights shone from any farm house windows, and that we were doomed to go on forever in that uncomfortable environment. The horse, however, did not agree with the driver as to the whereabouts of our destination. Dr. Boeckmann had apparently laid out a course on one of the great circles, while the horse was equally persistent in an effort to find a shortcut, which was located somewhere within the circle and to our right. The resultant of the action of these two discordant wills was that the buggy wheels would frequently sink in the cultivated soil of a wheat field, for being a grain farming region there were no fences. Then it became necessary to make ever widening circles around the horse and vehicle until the road was once more located. And so it went until at length we came to a farm house, and after much knocking and calling we were finally informed that we had circled around our objective, and, although we had started a dozen miles to the west of it, were now about as far to the east. The first streaks of dawn showed us the way to that long sought habitat of man, and the railroad station.

In the fall of 1897 the Society took over the work of the Library Association. Drs. Rothrock, Morley and Taylor, the first committee, were instructed to solicit funds and secure donations and bequests, as well as to supervise the smooth working of the library machinery, with all due diligence.

Urged by the demands of this stalwart young offspring, a period of surprising and rapid development came to the Ramsey County Medical Society. It was very evident that the mounting expenses of the library could not be met by the annual dues from the members, nor by the annual contributions.

Many and various suggestions were made. The one that seemed most promising was that the Society should publish a monthly medical journal. The journal could be exchanged with the great majority of American medical journals, would receive many books from medical publishers for review, and might succeed in selling enough advertising space to make substantial financial contributions to the library. In January, 1898, a committee was appointed to consider this subject from all angles. In the fall of the year the committee not only recommended that the Society publish its own journal, but also endorsed the project, offering to assume any and all financial liabilities that might arise during the first or probationary year. While not so stated, this guarantee was made by Dr. Boeckmann to the other members of the committee in order to insure the adoption of the report by the Society. Such was the wholehearted and generous character of the service he always gave to the Ramsey County Medical Society. He never stopped to count the cost and never asked how much there might be in it for him. In this case he saw that the Society needed funds, he believed the journal would become an important contributor, he knew that many members were afraid of the venture, and in order to insure the adoption of the report he was willing to back it to the finish. He was quite right. The clause carried the report, but by a very narrow margin.

The St. Paul Medical Journal lived through nineteen years. Its publication was suspended when the Minnesota State Medical Association decided to issue its own journal. The Ramsey County Medical Society retired from the field to insure the success of MINNESOTA MEDICINE. The advertising contracts, subscription lists and so forth were turned over to MINNESOTA MEDICINE, which is now thirteen years old.

Dr. Burnside Foster was made editor of the St. Paul Medical Journal, a position he filled most creditably until his death, when Dr. E. T. F. Richards succeeded him.

Dr. Taylor was the business manager for the first ten years, when Dr. J. M. Armstrong succeeded him.

At about this time, when the struggle for the St. Paul Medical Journal was in progress, Dr. Boeckmann donated to the organization his process of making pyoktanin catgut for surgical uses. The workers from his office, who had been trained by him in the long period of experimentation it had required to perfect the product in accordance with his stringent standards, were transferred to the Ramsey County Laboratory and the Society was launched on a commercial project. The manufacture of suturing material for surgical uses was a most appropriate activity for a medical socety to engage in. The laboratory committee from that day to the present time have supervised the sterilization, cleanliness and general safety of the product, which has never been allowed to sag "one jot or tittle" from the high standards set by its originator, and conse-

quently the venture has been crowned with success in every way.

In June, 1899, through the Medical Library Association, Dr. Rothrock reported a gift from Mr. Watkins Seamore of Troy, New York, of his father's valuable medical library of 340 volumes. From exchanges arranged by the Medical Library Association and by personal solicitations a large number of valuable books and entire sets of many journals, both domestic and foreign, were received. These donations came from medical libraries of Boston, New York, Washington, Cincinnati and other centers.

In 1904 the Ramsey County Medical Society, seeing that The Journal and the catgut had both made good, took another forward step by creating a trust fund to be known eventually as the Eduard Boeckmann Library Building Fund, this fund to be used for no other purpose than the erection of a home for the Society, with its various activities.

At the time of the foundation of this fund, Dr. Chas. A. Wheaton put into it a balance of $3,286.85, which he had carefully guarded for several years, while considering the best way to use it in the interest of the medical profession of St. Paul. It was the balance of a fund subscribed by the citizens for the entertainment of the members of the American Medical Association attending the St. Paul meeting in 1901. Dr. Wheaton had offered to refund this sum to the donors, but was told to use it for the medical profession.

This sum and the amount appropriated by the Society amounted to $6,055.62. The St. Paul Medical Journal, in addition to liberal appropriations to the library, added to the building fund the sum of $3,300.00 from 1904 to 1910.

The laboratory has always been a good provider for all the activities of the Society. Its yearly contribution to the building fund has been the backbone of that rapidly growing trust. In addition to this, the rapacious appetite of the library has received a generous slice of the catgut earnings every year, which for the period of 1904 to 1930 amounts to $22,349.00.

Dr. Boeckmann was a staunch believer in the wisdom of owning your own home, and prophesied on every occasion that eventually the society would build its own home from the profits of its suture factory. Although the fund has passed the $200,000 mark, the home he dreamed of is still in the future. The truth of the matter is that such a home should be liberally endowed, to guard against all contingencies.

The owners of the Lowry Medical Arts Building have presented the Ramsey County Medical Society with conveniently arranged and very attractive quarters on a long lease at a nominal rental, a most advantageous arrangement. The building fund should double itself during the duration of this lease.

Having thus outlined the early history of the library and the activities of the Ramsey County Medical Society which nourished it, let us glance at the achievements of a couple of latter-day saints who have contributed much to its career.

The name of Dr. John Milton Armstrong first appears on the library committee early in the twentieth century. His position as manager of the St. Paul Medical Journal gave him an opportunity to look after the interests of the library by safeguarding the continued success of that publication.

His devotion to the library knows no bounds. It has developed his talents as a book collector and has added to them those of an antiquarian interested in early types and the development of surgical instruments.

Dr. Wallace Cole, when president of the society, began the collection of old and interesting surgical instruments and appliances. Three fine cabinets filled with these specimens graced our former quarters and decorate the new one. One of these was presented by Dr. Arnold Schwyzer, one by the Miller Clinic, and one by the Earl Clinic and the St. Paul Clinic conjointly.

Among the rare books Dr. Armstrong has added to the library, two examples are worthy of mention: the Medical Repository, Philadelphia, a medical periodical, of which twenty-three volumes were published beginning in 1797; the Medical and Agricultural Register of 1806, containing the first description of epidemic cerebrospinal meningitis. The library contains also other valuable early American publications.

He is also responsible for the memorial tablets in our entrance hall. Relatives or friends of any deceased member of the society can secure a memorial tablet by making a donation to the library.

Dr. Eduard Boeckmann, our generous benefactor and wise leader, heads the list. The others in this roll of honor and the donors are:

Mrs. Frederick W. Van Slyke, for her deceased husband.

Mrs. E. J. Abbott and Mrs. C. C. Slaymaker, for their father, Dr. John Steele.

Mrs. J. C. Edge, for her husband, Dr. S. D. Flagg.

Mrs. J. W. Willis, for her father, Dr. A. Wharton.

Mrs. C. E. Smith, Sr., and Miss Mary G. Smith, for Dr. F. R. Smith, Dr. Chas. E. Smith, Sr., and Dr. Chas. E. Smith, Jr. (three generations of the family, while a member of the fourth generation, Chas. E. Smith, 3rd, is now taking the pre-medical course at Yale).

Mrs. Theodore Griggs, for her grandfather, Dr. T. R. Potts.

Mrs. F. B. Kellogg and Mrs. F. J. Ottis, for their brother, Dr. Paul B. Cook.

Dr. Harry Ritchie, for his father, Dr. Parks Ritchie.

The other heavenly twin of the latter-day saints is Dr. Frank E. Burch. It was he who succeeded in having the old Medical College Building on Ninth Street deeded to the Ramsey County Medical Society. This very desirable and valuable piece of property is now an integral part of the Boeckmann Library Building Fund.

We have a substantial inheritance from the fathers of the profession in St. Paul, men who were brave enough to begin the teaching of medicine in Minnesota many years ago.

All sciences are in a constant state of flux and change. None more so than medicine. A medical book five years old is proper fruit for the crematory.

With such a rapid deterioration the necessity for new and vigorous growth is very apparent. This explains the instructions that during the gay nineties were given to every library committee. Go forth along the highways and byways and get donations and bequests, for this library of ours is an animal with a voracious appetite and a capacity for rapid growth that must be fed, not with lime salts, but with gold.

The library at the present time has some 13,000 volumes on its shelves, and constitutes an important medical facility of the community, emphasized in the report of the committee on the cost of medical care as essential everywhere.

Miss Isabelle Anderson, A.B., B.S., a medical librarian of much knowledge, tact and experience, is in charge.

Our library books may be consulted by anyone and the medical profession of Minnesota knows that it is always welcome. The services of the attendant, the use of the study alcoves, and the most recent advances in medicine are all here and are to be had for the asking.

THE TREATMENT OF ANAL FISSURES

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Minneapolis

THE TREND in treatment of anal fissures veers more and more to a radical type as each individual surgeon studies his results and the basic factors in the recurrent cases. The history of the usual fissure is that of healing and recurrence; in a survey of the pathogenesis and complications the reason for recurrence becomes obvious and I hope to emphasize these factors.

Anal fissures occur in the skin just external to the mucocutaneous junction in the posterior quadrant. It is estimated that 90 or more per cent of fissures occur in the posterior anal quadrant and of the few anterior ones a predominant number will be found in female patients. Mechanical factors explain this predilection of fissures for the posterior quadrant. As the stool is contracted upon by the rectal musculature it is forced caudally with the anterior rectal wall lying almost straight and being rather well immobilized by the prostate in men and the uterus and adnexa in women.

The side walls of the rectum are limited in lateral excursion by the ischii so that as the stool passes down to the anus the posterior quadrant is the only part of the anal circumference in which much stretching may occur. This stretch occurring in the posterior quadrant, together with the curvature of the sacrum forcing the stool with a great deal of power over the posterior commissure, throws the brunt of the trauma in this location and a certain number of lacerations in posterior anal crypts are inevitable, particularly in constipated individuals where the stool is too hard and large. Infection readily occurs in this traumatized anal crypts and as the process is repeated from time to time a fissure is formed. Lymphocytic infiltration and fibrosis occurs in the base and sides of this ulcer, the edge becomes thickened and finally the ulcer heals over only to be reformed by a repetition of this sequence of events.

In such manner is the acute ulcer transformed into the chronic indolent but very painful fissure with the fibrosis and infiltration involving the sphincter, spasm results, and constipation entering the picture as a causative factor also becomes part of the vicous circle. The patient suffering from a fissure postpones passing the stool due to the pain incurred, and the longer he postpones it the more damage does the constipated stool cause. During the course of a fissure frequently a small abscess will form and burrow out under the skin either laterally or posterior to the ulcer. This may rupture back into the ulcer, in which event a blind subcutaneous tract is left, or it may rupture through the skin and leave a tract with an opening through which a probe may be passed to the fissure.

Except in their treatment, anal fissures offer the physician no problem. They are easily accessible for inspection and seldom may be confused with any other pathologic entity. Few conditions as simple as an anal fissure have been honored by the introduction of such a wide variety of remedial agents. Usually the fissure will be found to be associated with an external varicosity which will form an overhanging flap at the external margin of the ulcer, while frequently at the internal margin will be found an hypertrophied anal papilla. These three pathological entities, (1) the external varicosity or so-called sentinel pile, (2) the ulcer itself, and (3) the hypertrophied papilla, make up the typical textbook description of a fissure.

Symptoms of a fissure are rather more diagnostic than are those of most anal or rectal troubles. Recurring attacks of pain with passage of stools and amounts of bright red blood varying from a streak on the stool to a cupful occasionally, make up the patient's complaint. These symptoms will be present intermittently for years or until adequate intervention is provided. In reading over descriptions of fissures the thought impresses me that a superficial abrasion is frequently being mistaken for a fissure. These latter are best left without treatment, other than simple anal cleansing consisting of sponging the anal region gently with a piece of gauze wet with witch-hazel after each stool. There is little question but that some of these abrasions when cauterized will become true fissures. It is obvious that fissure treatment such

as caustic, of one kind or another, will produce a favorable result on many of these anal abrasions and prejudice the mind of the physician against more radical treatment.

Palliative measures such as silver nitrate, phenol, the actual cautery, curettage, dilatations, anesthetic ointments and solutions all are accompanied by a high percentage of inevitable failure because they do not rid the patient of all the pathological tissue present.

Palliative treatment does not remove these tracts and recurrence is inevitable if they are left. With these facts in mind wide excision of the ulcer-bearing quadrant of the anus must be the treatment. Sectioning the sphincter is not practiced except where this muscle forms a shelf across the wound preventing free and adequate drainage externally or where the muscle is incorporated in the base of the ulcer densely by infiltration and fibrosis. In case the sphincter is so involved, just enough of the muscle fibers are cut to provide a wound with a flat, clean base which will drain well. Divulsion is not advisable in any case but a mild dilation at times is necessary.

Either low spinal or sacral anesthesia gives excellent relaxation of the anus. While sacral anesthesia is slightly more difficult to accomplish than spinal I feel it is more suitable for most rectal surgery. It is difficult to explain to a patient why, after they have been told they may start walking about after forty-eight hours, they must lie flat in bed when a spinal headache is present. However, under either spinal or sacral anesthesia 100 per cent sphincter relaxation is obtained and contraction found in the anus will be recognized as due to fibrosis and scar tissue rather than muscle spasm. This factor makes regional anesthesia of the greatest help in proctological surgery.

A surgical technic which gives good control of bleeding and is of the simplest kind has been worked out. A plain catgut suture is so placed in the mucosa just above the muco-cutaneous junction that ample length is left on each end of the strand of gut for suturing. Using this suture as a steadying guide, excision of the ulcer is started just external to the suture. The line of excision is carried laterally on each side beyond the thickened skin margin of the ulcer and a wound made which is wide enough so the edges will not approximate when sphincter activity is re-established. No effort is made to keep the wound small, the excision being carried out posteriorly to the point where one is sure the wound will remain open posteriorly after the internal part of the wound is healed. Should examination under anesthesia with a probe reveal a subcutaneous tract, sinus or abscess, the wound margin is carried wide enough to include any such tract.

Mild bleeding may be encountered along the mucosal edge of the incision; a round needle is threaded on the suture already placed in the mucosa and the mucosal edge is sutured along the point where the old muco-cutaneous border existed. This is carried out with each loose end of the suture. In this fashion bleeding is controlled and the suture line acts as a splint to keep the wound edges from drawing together. A small piece of iodoform gauze is laid in the open wound and an inch-wide gutta-percha vent left in the anus.

Last but probably most important of all the steps in the patient's cure comes the matter of postoperative attention. Hot boric packs are kept on the wound from 2:00 p. m. to 10:00 p. m. the day of the operation and as indicated after the first day. The anal drain and the gauze covering the wound are removed after forty-eight hours and the patient told he may be allowed to let his bowels move. Usually this is sufficient; should it not be, a mild laxative may be given the next evening. After each bowel movement irrigation of the anal canal with water at 110°F. through an 18 F catheter is rigidly insisted on. Daily observation of the wound is carried on so that the patient's anal cleanliness may be checked and any appropriate steps taken should healing be advancing in an inadvisable manner. Mechanically washing out the anal canal with a mild antiseptic such as pure witch-hazel at each daily call is good practice. When healing is complete the wound area should present a broad, flat, firm scar which will be found to be firmer than the normal anal margin, thus providing reasonable assurance that recurrence will not take place.

SUMMARY

Diagnosis rests on finding a rather deep ulcer with thickened edges which will usually be in the posterior midline.

Radical excision under sacral anesthesia is demanded because this eliminates recurrences.

420 Medical Arts Building

DIVERTICULITIS OF THE COLON AND SIGMOID—ITS COMPLICATIONS AND TREATMENT*

ARTHUR E. BENJAMIN, M.D.
Minneapolis

THE real significance and surgical importance of diverticulitis of the colon is not generally recognized. It has not received the scientific attention that it deserves.

On account of the inter-relationship of diverticulosis, diverticulitis, and peridiverticulitis of the colon, they are herein jointly discussed under diverticulitis.

Nearly eighty years ago, Cruveilhier[16] described what is now known as diverticulosis of the colon, and Virchow[20] in 1853 gave a clear picture of the disease. Yet, today, the cause is not known, the disease with its complications often overlooked, and the treatment neglected.

HISTORY

Graser[9] in 1898 was probably the first to understand the nature of the inflammation, now termed diverticulitis, which involves the colon. He demonstrated that diverticula occasionally existed in several portions of the colon in one individual at the same time.

Fischer[20] in 1900, Beer[27] in 1904, and Gordinier and Sampson[8] in 1906 published articles on the disease. One of the outstanding early studies of the disease was made by Wilson, Mayo, and Griffin.[36] In this study the pathology was thoroughly analyzed.

In England, Moynihan,[17] and Telling and Gruner[25] published articles giving the X-ray findings in many cases. In France, Patel,[28] Cain, and Hillemand from 1911 to 1913 also contributed much information.

It was not until the X-ray was perfected that diverticulosis was found quite prevalent among the adult population. It was discovered that many of these diverticula caused no trouble until infection occurred, after which the symptoms occasionally became quite pronounced.

Various authors estimate the percentage of individuals suffering from diverticulosis as from 0.5 to 1 per cent, and from 12 to 18 per cent of these patients have diverticulitis. Sharples[21] says in regard to frequency of the disease, "I think, if all the individuals with diverticulitis could be collected together, and then those with appendicitis, it would be found that more have trouble with diverticula than with the appendix."

At the Mayo Clinic,[16] 26,699 X-ray examinations were made, and in 1,574 of these (or 5.89 per cent), diverticula were present. In 1,918 cases of diverticulosis, 653 had active diverticulitis.

Spriggs[22] reports on 158 patients with diverticula. Seventy-six of these were found in the descending colon, thirty in the ascending, thirty-one in the transverse portion, twenty-three in the whole colon, seven in the cecum, and four in the rectum.

In reviewing these tabulated cases, one is struck with the report of the sudden death or short period of illness of some patients. Several of these were due to peritonitis.

Spriggs and Marxner[24] found 10 per cent, in their patients examined by X-ray, showing diverticulosis.

Gordinier and Sampson[8] reported diverticula of the large intestine in sixty-four out of 8,132 autopsies in Dresden, nineteen out of 2,600 at Johns Hopkins, two out of 953 in the Bender Hygienic Laboratory, and one out of 2,382 in the Boston City Hospital. I am sure modern statistics will show a much larger proportion.

de Quervain[6] says that in a number of cases diverticula are merely postmortem findings without clinical manifestations and are often missed in the first stages at the ordinary pathological examination. At operations, they are passed by as innocent ordinary adhesions and unrecognized as diverticulitis.

CLASSIFICATION

Spriggs,[23] Case,[4] Rankin and Brown,[20] Mayo,[16] and Mailer[15] have offered various classifications of the disease according to stages, symptoms, complications, and so forth.

Inasmuch as diverticulosis, diverticulitis, and peridiverticulitis are the various stages of the

*Read before the Western Surgical Association, Kansas City, Dec. 5, 1930.

same disease and may be present in the same individual at one time, a classification like the following seems sufficiently comprehensive:

1. Spastic colitis or prediverticulosis stage.
   a. With stasis.
2. Diverticulosis
   a. Simple
   b. With fecaliths
3. Diverticulitis
   a. Simple
   b. Ulcerative with hemorrhages
   c. With hyperplasia and stenosis
   d. With infection
   e. Perforating
   f. With malignancy
4. Peridiverticulitis
   a. With adhesions
   b. Acute obstruction
   c. With abscess
   d. With peritonitis
   e. With complications, fistula
   f. With malignancy

John F. Erdmann[7] and C. D. Overton[19] believe, from clinical experience, that the cause is congenital, as they have found protrusions along the whole alimentary tract from the esophagus to the rectum.

Pieth, Patterson, Graser, Schreiber, Wilson, and many others believe that weak areas occur in certain portions of the colon preceding diverticulosis.

E. T. Bell[2] believes that congenital weakness of the muscle walls and manner of blood supply are causative factors.

C. D. Harrington[11] reports a case where a diverticulum protruded into the pelvis from the rectum back of the uterus.

Between the mesenteric and lateral muscle bands, the blood vessels penetrate the inner circular muscular fibers to enter the submucosa just before they reach the longitudinal bands on either side of the colon, constituting weak places in the bowel wall (Fig. 1). The fat epiploic appendages lie between the longitudinal bands laterally, and into these the hernia forces its way along the blood vessel entering the tag. The diverticulum is often concealed by these fatty tags.

W. D. Haines[10] calls attention to the fact that the upper portion of the sigmoid has a short mesentery and is covered with peritoneum only on the anterior and lateral surfaces in 90 per cent of cases.

Age has much to do with the production of diverticulitis, as most individuals suffering with the disease are found to be above forty-five. The disease is probably more prevalent in persons around fifty or beyond. At this time in life, individuals follow more sedentary habits, and,

Fig. 1. Drawing showing where the muscular coat is pierced by the blood vessels from the mesentery, constituting the seat of election for diverticula (after Drummond). From Robert Mailer, The Lancet, July 14, 1928.

consequently, the peristaltic action of the intestine is less vigorous and the muscle tone is generally less positive. A sclerosis of the vessels referred to above is a potential cause.

Robert Mailer[15] gives the following age and sex incidence:

In 100 cases of diverticulitis

Age	M	F	Age	M	F
20 to 30	0	1	50 to 60	25	11
30 to 40	6	4	60 to 70	19	5
40 to 50	17	8	70 to 80	3	1

John W. Keefe[14] states, "Diverticula occur twice as often in males as in females, and 60 per cent of diverticula have serious sequelæ." My own cases show about an equal number of diverticula in both sexes.

The anatomical arrangement of the colon, and its physiological function in which there is a slowing up of the contents of the bowel, leads to a stagnation in certain areas. Especially is this noticeable in the sigmoid, where the content becomes more firm, causing pressure and lowered vitality of the tissue.

A. C. Jordan[12] states that colitis is one of the most common causes of diverticula. On the other hand, Case[4] is of the opinion that colitis is the result rather than the cause of diverticulitis. It is reasonable to suppose that a colitis might lessen the resistance of vulnerable points in the colon and predispose the areas to diverticulosis.

Constipation is believed to be an important factor in diverticulitis.[26] Hardened fecal materials produce ulceration, and it is believed that the sigmoid, therefore, is the most commonly affected.

Perhaps the character of the food of humans,

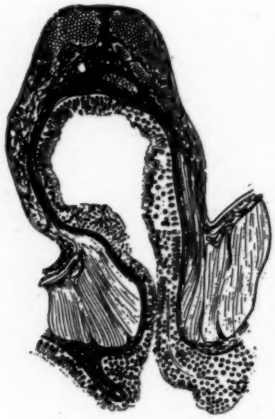

Fig. 2. The same as Figure 1.

the mode of living, and habits have much to do with the cause of diverticulitis. Coarse foods do aggravate it. A reasonable amount of outdoor exercise, such as golf, is beneficial in the early stages.

Dr. C. P. Fitch, Chief of the Division of Veterinary Medicine, University of Minnesota Agricultural College, reports in a special communication that diverticula are occasionally encountered in the large bowel and colon of the horse due to hard balls of feces. They are found less often in cattle, but occasionally in dogs, due to pressure of a foreign body.

SYMPTOMS

Some of the following symptoms are present in each case of diverticulitis. A typical case may experience most of them up to the serious or complicating stage.

1. Increasing disturbances from gas in the intestine.
2. General abdominal distress and pain.
3. Constipation.
4. Pain in left iliac region.
5. Bladder discomfort and frequency.
6. Occasional diarrhea.
7. Nausea and vomiting.
8. Pain in rectum.
9. Passage of blood.
10. Gradual loss of weight.
11. Acute attacks of pain with fever and chills.
12. Acute obstructive symptoms.
13. Acute perforative symptoms.

Pain and tenderness may be general when several diverticula along the colon become inflamed.

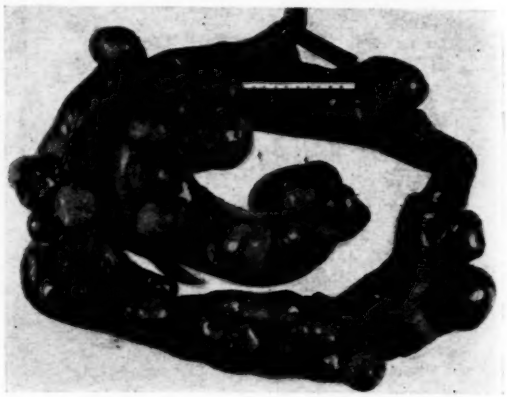

Fig. 3. Multiple diverticula of the colon. From Dr. E. T. Bell's Textbook on Pathology.

Localized soreness with a palpable mass is often confined to the sigmoid. The temperature, pulse, and leukocyte count usually rise in acute attacks, and the symptoms are occasionally mistaken for an attack of acute appendicitis.

Where a peridiverticulitis has occurred, obstructive symptoms not infrequently supervene and, when there is a history of declining health and the passage of some blood, cancer is often suspected.

Judd and Pollock[13] observed blood in 18 per cent of cases of diverticulitis and 47 per cent of those of carcinoma.

Carcinoma may be present in the same case with diverticulitis. Mayo[16] reports 15 per cent present. Ballin[1] is of the opinion that carcinoma may follow diverticulitis. Therefore, a suitable operation should be performed if carcinoma is suspected.

Rankin and Brown[20] report, out of a series of 227 cases of diverticulitis, only four associated cancer cases, and in 679 cancer operative cases, diverticulosis was found in four only.

DIAGNOSIS AND COMPLICATIONS

Before the advent of the X-ray, the profession made little headway in the diagnosis of diverticulitis. Many diverticula are missed today due

to their position, or to their orifices being occluded or too small for the barium to enter. Owing to careless or imperfect technic, or lack of knowledge and experience of the technicians or interpreters, a negative report may be given. Diverticula may retain the barium many days, demonstrating how long enteroliths may remain in some diverticula. Case[14] reports one individual who had multiple diverticula which were still filled on the sixteenth day. Others reported even longer periods.

Perhaps the disease which is most frequently confused with diverticulitis is acute appendicitis. A periappendicular inflammation due to an adherent infected diverticulum can easily be mistaken for an ordinary appendicitis.

A cystitis has led many clinicians astray. They have not always recognized the cause as arising from an abscess of a diverticulum and bladder infection therefrom. Likewise, prostatic symptoms in the male as well as bladder pressure and discomfort in both sexes can originate in a diverticulitis of the sigmoid. A tumor in the left pelvis in the female does not often lead the ordinary practitioner to seek its origin in an inflammation of the sigmoid. No doubt, some are operated upon and an adherent tube or ovary is removed with the diagnosis of salpingo-oöphoritis.

An attack of diverticulitis may be mistaken for a volvulus or vice versa. Pancreatitis, gallbladder disease, intussusception, or tuberculous peritonitis can be confused with diverticulitis. So-called abdominal adhesions are operated upon as frequently as any other condition without the knowledge that they may be nature's barrier preventing a perforating diverticulum from infecting the peritoneal cavity.

Old abscesses, originating from perforating diverticulitis where pus has traveled to remote corners of the abdomen and opened elsewhere, may be very difficult to trace. Backache, sacro-iliac discomfort, and many unfathomed neuralgias and pains may, in the future, be traceable to diverticulitis in some cases. An ischiorectal abscess unquestionably is frequently due to diverticulitis of the lower sigmoid or rectum.

TREATMENT AND PREVENTION

It is probable that fewer cases of diverticulosis and diverticulitis will develop in the future on account of the careful supervision of diet habits of children by the pediatrician.

A case of diverticulitis should constantly be kept under observation and treated to avoid the inflammatory stage, if possible. Perhaps the selection of proper diet, colon irrigations, and olive or mineral oils may assist in preventing diverticulitis. Exercises in which the abdominal muscles

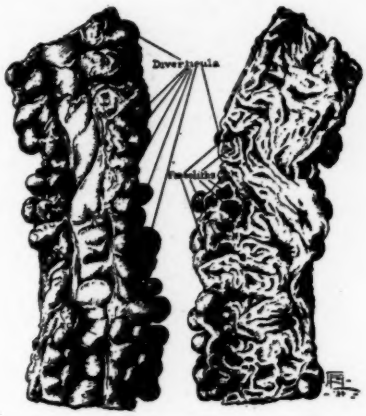

Fig. 4. Multiple diverticula of the descending colon filled with feces. From Rankin and Brown's article on "Diverticulitis of the Colon," S., G. & O., April, 1930.

massage the intestines are beneficial in assisting the diverticula to empty, and favoring regular normal evacuations.

When a surgeon is confronted with symptoms of impending perforations, peritonitis or obstruction, it is his duty to institute surgical relief early. A late operation may be unsatisfactory, imperfect, or useless. When the operation is performed early, before the patient is in a serious general condition, the diverticula may be inverted, the region drained, or the bowel resected, perhaps with satisfactory results or without serious consequences. A preliminary colostomy in severe obstructive cases is the operation of choice, and this may be done by bringing the descending colon, above the obstruction, partly out through the abdominal wall, passing a fascial strip through the mesentery for support. Later, when the patient is in good condition, the bowel may be resected, unless the infection and obstruction disappear. The bowel may then be replaced within the abdomen by cutting the fascial strip, separating it from the wall, and allowing it to drop back. The colostomy can be closed later. A side anastomosis can be performed, if preferred, excluding the obstructed area, and, by leaving the colostomy open temporarily, undue

tension on the enterostomy stitches is prevented.

On account of the frequency of carcinoma associated with diverticulitis, resection should be performed in suspicious cases, even though the obstruction may not be complete.

Overton[19] states that we may expect 90 per cent cures in diverticulitis by early expert surgery.

Fig. 5. Carcinoma of the colon developing in the presence of a diverticulum. From Rankin and Brown's article on "Diverticulitis of the Colon," S., G. & O., April, 1930.

Bensaude and Hillemand[3] prefer a colostomy if a removal of the mass is impossible.

Gerzowitsch gives a mortality of 12 per cent in a series of sixty-one cases resected.

When the disease is confined to a known area or section, resection is the choice where possible, but a resection performed when other nearby tissue harbors diverticula that are infected courts disaster. A colostomy may save the patient and permit a later safe radical curative operation.

CONCLUSIONS

1. As a possible focus of infection, diverticulitis is often overlooked.
2. The location and direction of the lateral blood vessels of the colon and sclerosis of these vessels may predispose to herniation.
3. Congenital weakness or defects in the colon wall are recognized possibilities.
4. Age, obesity, and sedentary habits may favor the development of diverticula.
5. Improper habits and unsuitable food may account for their unusual frequency in humans as compared with that of other animals.
6. Symptoms caused by diverticula are misleading and sometimes attributed merely to indiscretion in diet.
7. The diagnosis can and should be made early, by means of an X-ray examination.
8. Treatment should be directed toward preventing further progress of the disease when possible.
9. Operations for diverticulitis and its complications include some of the most formidable surgical procedures known. Experience, judgment, and skill are necessary to obtain the maximum results.

The following will illustrate a few of the cases of diverticulitis that are encountered, some with severe and acute symptoms as well as complications.

CASE REPORTS

Case 1.—Perforation of Diverticulum and Sudden Death.

Mr. O., a widower, aged 68, and a laborer, had complained for some time of gas and occasional pain in the lower left abdomen. While going to work one morning he was seized with pain in the lower abdomen. He dropped to the ground as though shot and was picked up in a very weak condition. When he arrived at the hospital he was pale, had an irregular and weak pulse, and was in shock. He showed evidence of some acute abdominal condition.

He was given stimulants and hypodermoclysis, and was operated upon. We found a perforation of a diverticulum of the sigmoid with the contents of the bowel in the pelvis. He gradually failed and died the next day, apparently from the effect of shock.

This case demonstrates the serious consequences that may arise in a case of diverticulitis.

Case 2.—Diverticulitis with Infection, Obstruction, Abscess and Pelvic Peritonitis and Pneumonia.

L. A. L., a male, aged 57, had been sickly as a child but quite well after the age of twenty, except for attacks of tonsillitis. He had a small left hernia repaired in 1915 and had had an attack of sciatica in 1919. He states that he has had some prostatic trouble of late and used to have considerable backache when younger. He has had pain in his right side and back for a month and an acute sciatica and backache for over two weeks.

The patient was taken suddenly ill on the morning of January 10, 1922, with pain in the left inguinal region, the pain radiating upward with some general abdominal discomfort, considerable nausea, retching and vomiting. The patient became very restless and extremely thirsty. Temperature ranged from normal to 99.2. The pain became less in the afternoon and his temperature became normal. The leukocyte count

ranged from 13,000 to 17,000 the first two days in the hospital. His bowels moved on the first day after an oil enema and later after a low modified *Noble's* enema. The evening of the next day he became worse, with increased pain and vomiting. The abdomen was somewhat distended, and a mass with dullness was present above Poupart's ligament on the left. On account of the increased severity of the symptoms and suffering, an operation was performed on the second evening.

A left rectus incision was made under local anesthesia. A mass of adhesions was present around the sigmoid with marked diverticulitis. Numerous diverticula containing fecal concretions were found. The lymphatics were enlarged. Some of the fecaliths were forced back into the bowel through the openings, and the diverticula ligated. Owing to the extensive involvement of the bowel, resection was thought inadvisable. A Penrose drain was placed in the region of these adhesions.

The patient progressed satisfactorily for a few days. He had some hiccoughing and vomited occasionally. Gastric lavages relieved the vomiting. His abdomen became less distended and he was able to retain some nourishment. There was more or less drainage from the wound. He, however, developed an obstruction later necessitating a colostomy, which improved his condition somewhat. A bronchial pneumonia supervened, however, and he died, February 1, twenty days after the acute abdominal symptoms began.

Case 3.—Diverticulitis with Diseased Thyroids, Fibroid Uterus.

Mrs. A. R. P., aged 53, had had a radical operation for cancer of the left breast in 1911. Ligation of the inferior and superior poles of the thyroid had been done in 1911. The patient had been very nervous and had had more or less pain in the left abdomen, but no nausea or vomiting. There had been some diarrhea at times, dysuria and disturbed vision.

Examination showed the thyroid, especially in the region of the isthmus, markedly enlarged. There were fibroids of the uterus with retroversion. A few hemorrhoids were present.

On account of toxic symptoms, a thyroidectomy was performed and five-sixths of the thyroid lobes was removed. Progress was satisfactory as far as the thyroidectomy was concerned, but the patient still continued to have pain and abdominal distress.

X-ray examination showed several diverticula in the descending colon and sigmoid. There was no evidence of diverticulitis, obstruction or new growth at this time, but a prolapse of the transverse colon was evident.

The uterus was enlarged to twice its normal size, retroverted and contained fibroids. The appendix was retrocecal and fixed. An appendectomy and a supravaginal hysterectomy were performed.

The patient made a satisfactory recovery from the operation but still complains of constipation and abdominal distress. The bowels move every other day, but she has some abdominal distress and distention if she is not careful about her diet or eats too much. She gets tired and nervous at times, but looks much better. She is more energetic, has a better color, and has gained slightly in weight. We do not expect this patient to become perfectly well, but care in her diet should prevent her diverticulitis from growing progressively worse.

Case 4.—Acute Bowel Obstruction from Diverticulitis.

Fig. 6. X-ray of colon (Case 5) showing multiple diverticula.

Miss D. C., aged 42, had always had good health until a month previous to examination, when she began to be troubled with extreme constipation and marked abdominal distention, followed by nausea and vomiting and symptoms of acute obstruction.

At operation, some adhesions were found around the gallbladder. The cecum, ascending and transverse colon were greatly dilated and complete obstruction was found at the lower portion of the descending colon, annular in type. The descending colon was separated and a loop brought up into the wound. It was anchored to the peritoneum and a fascial strip passed through the mesentery of the bowel for support. A tube was stitched into the bowel. Microscopic examination of tissue removed showed no cancer, but an acute inflammation from diverticulitis, with ulceration.

Progress was satisfactory excepting that the blood supply was somewhat interfered with. About two inches of the obstructing portion sloughed and a considerable drainage occurred. The obstructing and sloughing area was removed by cautery at a later date.

A second operation was performed to unite the lower and upper rectal colon. Many adhesions were separated and a side anastomosis of the distal and proximal portions of the colon was made. The former opening was left for a vent.

Since that time there has been some drainage and a few fistulæ, originating from the site of the anastomosis. She now has a small fistula and there is a little fecal discharge occasionally from the colostomy opening, but she has a normal bowel movement daily. The remaining fistula can be closed as soon as the inflammatory trouble disappears and the tissues are in condition for the repair work.

Case 5.—Multiple Diverticula of Colon with Perirectal Abscess.

Mrs. B., aged 63, a nurse, had suffered from gastrointestinal disturbance for years. Diverticula were discovered about fourteen years previous (Fig. 6). She has had marked constipation, considerable dysuria and frequent micturition, occasionally passing some blood from the bowel. She had had perirectal abscesses in 1927 and fissures for some time. The abscess was apparently due to diverticula of the rectum. She was operated on in 1927 with drainage and good recovery. Hypertension has existed for a number of years.

Fig. 7. X-ray of colon (Case 7) showing diverticulitis of the transverse colon and spasticity.

Fig. 8. X-ray of colon (Case 9) showing narrowing due to peridiverticulitis.

Gastrointestinal symptoms have become considerably less and she is in fairly good general health. She has no trouble with the rectum. She has lost about fifteen pounds in weight during the last five years. Hypertension is still present.

Case 6.—Diagnosis of Cancerous Growth in Pelvis, but Probably Due to Diverticulitis.

L. H., a housewife, aged 71, had suffered from extreme constipation, gradual loss of weight, nausea and vomiting. Her weight was about eighty-seven pounds and her previous attendant had diagnosed cancer in the pelvis.

Upon examination the colon was found to be greatly dilated, giving the impression of a cyst in the pelvis. There was a prolapse of the uterus with some cystocele and rectocele. A tympanitic note was present over the cecum, transverse and upper portion of the descending colon. No solid mass was found in the pelvis but there was a slight dull area in the region of the sigmoid. The urine showed a trace of albumin and sugar, and clumps of pus cells. The hemoglobin was 75 per cent. X-ray showed an enormous dilatation of the entire colon as far as the sigmoid. A barium enema was not retained because of obstruction in the upper part of the rectum. Examination by sigmoidoscope showed no ulceration or growth.

On August 1, 1930, under local anesthesia, a colostomy was done, bringing a loop of the descending colon up and out of the abdomen, using a fascial strip through the mesentery of the colon for support, and inserting a rubber tube into the colon through which frequent irrigations were done to empty the colon and reduce its size. The colon above the obstruction was greatly dilated. A small mass in the region of the sigmoid, due to inflammatory trouble in and around the sigmoid, like a diverticulitis and not like cancer, was found. A specimen removed failed to show carcinoma. The patient began to improve, and gained in weight and strength. The colostomy opening functioned perfectly. She is up and about, able to wait on herself, get her own meals, and seems quite well generally. The colon is reduced two-thirds in size so that the tympanitic note has disappeared. The abdomen remains flat. The bowels frequently move normally.

Case 7.—Diverticulitis with Chronic Indigestion.

Mr. D. C., aged 58, has had indigestion, belching of gas, constipation, abdominal distention and soreness along the transverse and descending colon for a number of years. He has passed some blood occasionally.

X-ray showed diverticulosis and diverticulitis of the transverse colon and sigmoid (Fig. 7).

Special diet, mineral oil, oil enemata, bowel flushing, and moderate exercises have lessened the distressing symptoms and resulted in much improvement. He passes little or no blood now but has moderate distress in the abdomen at times.

Case 8.—Possible Diverticulosis.

C. J. D., aged 47, a bond salesman, weighed 190 pounds and was 5 feet, 9 inches tall. He had had a double herniotomy in 1910, and tonsillectomy and adenoidectomy in 1918. He had also had influenza and the usual children's diseases. He has had more or less gastrointestinal disturbance, with pain in the region of the appendix.

In November, 1929, he had an attack of appendicitis and was operated upon. Previous to that time he had

had some trouble with flatus, hyperacidity of stomach, and some nausea. Several adhesions in the lower left abdomen were found at operation.

A barium enema before appendectomy showed several diverticula in the pelvic colon and some spasm of the tip of the cecum. The urine showed a heavy trace

Fig. 9. X-ray showing multiple diverticula of the descending colon without symptoms.

of albumin, and a large trace of sugar, but this disappeared while he was in the hospital. In February, 1930, he had an acute cold, a leukocyte count of 10,500, and a trace of albumin in urine. About this time he began to have more or less dizziness, bloated abdomen, and some headache. Diet, bowel flushes, oil enemas, etc., caused gradual improvement.

At present he is feeling very well, the dizziness has about disappeared, except when lying on his back.

Case 9.—Diverticulitis and Peridiverticulitis.

H. L., age 68, a female, gave a history of hemorrhoids, abdominal distress, with pain, general discomfort and constipation, dysuria, and pain in the back. In 1925 the hemorrhoids were removed. Later a proctoscopic examination revealed some redness and inflammation in the upper part of the rectum, from which area there was slight bleeding.

X-ray revealed diverticula of the sigmoid and lower portion of the descending colon (Fig. 8). There was an inflammatory exudate in these areas, partly constricting the colon. The patient progressively grew worse and developed obstructive symptoms.

On February 6, 1929, a laparotomy was performed. The sigmoid was entirely involved and almost completely obstructed, the descending colon fixed by numerous adhesions. A colostomy was done above the obstructed area. A fascial strip was passed through the mesentery of colon for support, a Penrose drain placed in the region of the infected diverticula and a tube was stitched into the colon. The patient progressed favorably, but developed an abscess which extended to the right side of the abdomen, and was later opened and drained. The gallbladder was very much enlarged and adhesions were pronounced in that region. Bladder symptoms were quite aggravated during all this time and considerable pus was found in the urine. Cystoscopic examination showed a definite cystitis.

Convalescence was rather stormy but gradually the patient improved and with the exception of a somewhat narrowed colostomy opening and a post-operative hernia she is in fairly good health. She occasionally has some fecal passages per rectum. All inflammatory trouble seems to have disappeared, as well as the bladder discomfort.

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THE WHOOPING COUGH PROBLEM*

L. W. Sauer, M.D., Evanston, Illinois: The etiology, the mode of dissemination, and the laboratory diagnosis of whooping cough are well established. It is the most prevalent communicable disease of early childhood, mainly because it is customary to procrastinate about diagnosis and quarantine until the whoop has developed. As in measles, the most contagious period is the catarrhal stage, that is, before the clinical symptoms are typical. To make an earlier diagnosis mother and physician must become "whooping cough minded." The cough plate of Chievitz and Meyer is comparable to the culture for the diagnosis of diphtheria. The plate must be exposed relatively early and must be well coughed on; it requires three or fours days' incubation. Patients do not always exhale pertussis bacilli. A child may have typical paroxysms without expelling pertussis bacilli on the plate. It is best to expose plates in duplicate. A negative plate does not exclude pertussis.

Leukocytosis, especially lymphocytosis, characterizes the spasmodic stage, but is usually absent early in the catarrhal stage. The earlier in the course of the disease, the less characteristic the cough, and the lower the blood count, but the more likely will the cough plate be positive; the farther along the disease, the more typical the cough, and the higher the count, but the less likely will pertussis bacilli be isolated. The mortality rate is 1 per cent of the cases for all ages; it is 33 per cent of the cases when computed for infants aged less than one year.

Fresh, not cold air, proper food and aseptic nursing care are essential; quinine, phenobarbital and ether by rectum are valuable adjuncts which help give symptomatic relief. Vaccine, as used at present, is of doubtful therapeutic value.

*Abstract of paper presented before the meeting of the Northwest Pediatric Society, Rochester, Minnesota, July 11, 1931. Taken from Proceedings of the Staff Meetings of the Mayo Clinic, July 8, 1931.

A PROPOSAL OF WHOLESALE PASSIVE IMMUNIZATION AGAINST POLIOMYELITIS EPIDEMICS*

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THE writer feels some trepidation in putting the following suggestion into print because he has developed his point of view only through apparently logical deductions from premises which have not been sufficiently clearly demonstrated to permit classing them as established facts. It must not be thought, therefore, that wholesale passive immunization will surely be even a partially suitable weapon against poliomyelitis. But the ineffectiveness of our present attempts to stop the spread of epidemics of this disease is sufficient excuse for a presentation of this sort, and justifies the advocacy of any reasonably promising public health procedure, provided that the measure is not prohibitively expensive of time and money, and provided that it will conceivably do no harm. This paper then is nothing more than a plea for the trial of an experiment that might work as desired.

After the writer's own ideas were well systematized previously to writing this paper, he found a short article by Moro,[1] with essentially the same proposal as is here presented. Also, during the preparation of the manuscript, a paper by Flexner[2] appeared, in which he dwells in a few paragraphs on the possibly desirable effect of the same means of attack as is here outlined.

Let us consider the premises on which this proposal is based. The first four are the result of long series of investigations, both experimental and clinical. They have been discussed repeatedly in the various monographs on poliomyelitis; hence no attempt will be made in this paper to give credit where credit is due. The fifth one revolves about the recent experimental work of American investigators, which is especially significant, and will receive special treatment. The premises follow:

1. The usual incubation period of poliomyelitis varies between four or five to eight or nine days. In a series of about 200 cases of monkey poliomyelitis induced experimentally in previously untreated animals at the University of Minnesota, the longest time interval was 22 days. Incubation periods of more than two weeks in our experimental animals have been rather exceptional.

2. An attack of poliomyelitis confers regularly a strong, lasting immunity. The extreme rarity of two attacks in the same individual is evidence for this point. Further, it is difficult to produce the disease in a monkey that has recovered from a previous attack.

3. The blood serum from a person or monkey that has had a previous attack of poliomyelitis will inactivate the virus. If such an immune serum and a potent virus are mixed in the test tube and a portion of this mixture is injected cerebrally into a monkey, the animal either will develop no poliomyelitis, will have a light attack, or will develop the disease only after an abnormally prolonged incubation period.

4. The blood serum from a person or monkey recovered from a previous attack apparently contains antibodies which will produce passive immunity in another animal. Thus, if this immune serum is injected into a susceptible monkey and then, within a few hours or days of time, the animal is inoculated cerebrally with active virus, the animal will be partially or completely protected against the inoculation. The length of time this passive immunity lasts is not known. An experiment is already under way for the elucidation of this point in the writer's laboratory. By analogy with other conditions in which passive immunity can be produced, this period probably extends other several weeks of time; it would thus be expected that the period will be found at least as long as, or likely longer than, the incubation period of the disease.

5. Aycock and Kramer,[3] Shaughnessy, Harmon and Gordon[4] and Schultz and Gebhardt[5] have tested the serums of normal individuals who give no history of a recognizable attack of poliomyelitis. The method of testing was to draw blood from these persons and discover whether this blood would neutralize virus *in vitro* as stated in premise three above. Neutralization

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was taken as evidence of immunity. Their work tends to show that seventy-five or eighty per cent of adults living in the larger urban communities possess blood serum with relatively large amounts of poliomyelitis antibodies and that these people are apparently actively immune to the disease. In the rural communities the immunes constitute probably half of the adult population. The assumption has been made that these normal immune adults have acquired their immunity by one or more contacts with the virus which, for some unknown reason, resulted in immunization, rather than in an attack of the disease.

The experiments of these students of poliomyelitis have to do with a number of cases which is altogether too small for definite conclusions statistically. But their work is strongly supported by the fact that relatively few persons are attacked by the disease after adolescence, and as the age grouping is increased after the first decade, the incidence of the disease rapidly decreases. In the great New York epidemic of 1916,[6] for example, 95 per cent of the cases occurred during the first decade and only 0.3 per cent of the cases occurred after forty years of age. Hence, it is extremely probable that the vast majority of normal urban adults and a somewhat smaller number of those in the country are immune in the same way that recovered cases are immune. The normal adults in a community thus constitute a large reservoir of antipoliomyelitic serum.

The problem then becomes one of making use of this reservoir. It is impractical to test these people individually to determine which ones are immune because of the necessity of using monkeys for the biological test and the extreme expense that would be involved in the large number of animals required. One hesitates to use serum picked at random from unselected adults for the specific treatment of a diagnosed case of the disease because of the chance that the donor's blood might come from the non-immune group. One does not care to gamble with percentages in such a case; and this is usually not necessary because there are nearly always enough recovered cases in a community or individuals who have previously been definitely in contact with poliomyelitis to permit their selection as donors for the developing cases that need immune serum treatment. But for a prophylactic public health measure we are entirely justified in working with percentages because it is well known that epidemics, of smallpox, for instance, can be brought under control by measures which make no pretense of building up resistance in one hundred per cent of the population.

Suppose, then, that in the presence of a beginning epidemic in a city, we were to take blood at random from the adult population and inject it in proper amounts into the members of the most susceptible age groups, that is, into children from one to twelve or thirteen years of age. The goal would be to inject as many susceptibles as possible within the shortest possible time to obtain a maximum effect of passive immunity for a given interval of time, thus reducing the amount of soil on which the epidemic could thrive. The simplest way to do this is to take parents as the donors and inject their own children with the parents' blood or with serum prepared from this blood. This avoids the necessity of setting up a laboratory technic to prevent the transmission of syphilis, though the possibility of a parent acquiring syphilis after the birth of the child must be kept in mind.

It follows reasonably well from the five premises presented in the foregoing that such a procedure would actually immunize a large percentage of the susceptibles in a community, and that, if the injections were completed within a few days, enough children would be able to resist invasion of the organism for a sufficient time so that the epidemic would lose its foothold and die out before the period of passive immunity would be lost. Further, it is logical that many of these children might accidentally come into contact with the virus during the period of immunity and be immunized actively and permanently by this contact without ever developing a clinical attack of poliomyelitis. Rhoads' work,[7] in which he was able to produce active immunity in monkeys by the injection of mixtures of immune serum and active virus, is suggestive that this desirable result might well be obtained.

Let us now attempt to make a measurement of the probable effectiveness of our passive immunization. It is necessary to assume that our reasoning up to this point is correct. Let us likewise assume that eighty per cent of the adult urban population taken at random would be found immune, as discussed under premise number five. If, then, for each child whom we wish to immunize in a large series of cases, we were to select an adult at random as the donor, the chances are

that we would immunize eighty per cent of the children in the community. This in itself would be a very satisfactory result from an epidemiological standpoint, but we can do considerably better than this without adding greatly to our trouble. Let us consider the chances of immunization if we take the blood from two adults (father and mother) and inject the mixture from both into the child. Obviously the chances are that in some families both father and mother will be immune, in others either the father or the mother will be immune, and in some, neither father nor mother will be immune; the calculation of the chances of each of these combinations occurring is easily done arithmetically.

Jones[8] states the proposition mathematically as follows: "Thus to get the probability of a double success for a combination of two independent events, we must multiply together the separate probabilities for the success of each event taken by itself." In our case the chances are eighty in one hundred (80/100) that the father is immune; the chances are likewise eighty in one hundred (80/100) that the mother is immune. If we select a family at random then and wish to know what the chances are that both parents are immune, they will be $80/100 \times 80/100 = 64/100$, *i.e.*, 64 in 100.

Similarly, if we wish to know the chances of the father being immune and the mother non-immune, they will be $80/100 \times 20/100 = 16/100$.

The chances of the mother being immune and the father being non-immune are $20/100 \times 80/100 = 16/100$.

Adding together, then, the above results, for it is evident that a family cannot be simultaneously in more than one of these groups, it follows that there are 96 chances in 100 ($64/100 + 16/100 + 16/100 = 96/100$) that one or the other of the parents, or both of them, are immunes if we select at random a family out of the general urban population. Conversely, there are only four chances in one hundred that the parents in this family will both be non-immunes.

Since the writer is not particularly trained mathematically, he gladly followed the suggestion of a University of Minnesota mathematician that these figures be put to an empirical test with a deck of cards, as follows.

The black cards were taken to represent males; the red cards, females. The twenty black cards numbered from one (ace) to ten were considered immune males; the similarly numbered red cards, immune females. Five of the black face cards represented non-immune males; five of the red face cards, non-immune females. Thus we had the character of immunity represented in the proportion of eighty per cent in our cards. The red and black cards were shuffled separately and were then laid on the table in pairs of one black and one red card each, thus representing married couples. To test our foregoing calculations it was then merely a matter of counting the number of times in a sufficient series of trials that (1) a black numbered card was paired with a red numbered card, (2) a black face card, with a red numbered card, (3) a black numbered card, with a red face card, and (4) a black face card, with a red face card. Arbitrarily, we repeated these trials until we had made up 625 couples. The percentage incidence of each group was then calculated with the result in immunological terms that:

1. The character of immunity occurred in both mates in 64.16 per cent of the pairs, as against the expected figure of 64 per cent.

2. Immunity occurred in the male but not in the female in 15.68 per cent of the pairs, as against the expected 16 per cent.

3. Immunity occurred in the female but not in the male in 15.84 per cent of the pairs as against the expected 16 per cent.

4. Immunity occurred in neither the male nor the female in 4.32 per cent of the pairs as against the expected 4 per cent.

This is sufficiently close correspondence of the theoretical and empirical figures to satisfy any reasonable objection raised against the technic of the calculation. It is clear, then, that if 80 per cent of the parents are immune, the chances are 96 in 100 that one or both of the parents in a given family will contain poliomyelitis antibodies and theoretically we should expect to immunize about 96 per cent of the children treated.

One might object that the figure of 80 per cent is too high. This cannot be disproved, but one is to be reminded that the clinical evidence on the age incidence of poliomyelitis is strong that the percentage of immune adults is actually high. If we substitute 60 per cent for 80 per cent and make our calculations, it will be found that the chances are 84 in 100 that one or both parents in a family will be immune. For the rural population, in which half of the adults have been as-

sumed to be immune, our calculation would give us chances of 75 in 100 that the families will have parental immunity on one or both sides. This percentage would still probably be effective in combating an epidemic.

Now let us try to visualize the actual handling of an epidemic by these means.

The first point is that, since the efficacy of the procedure is uncertain, there should be provided a mechanism for keeping records on which to base future studies of the cases presumably immunized. For the first several trials, it is of extreme importance to the public and the medical profession to make as extensive a study of the situation as money will permit, so as to discover, if possible, the facts that will guide our steps in future epidemics. In the long run this will save money and effort.

In the second place, the procedure should be undertaken by the various interested groups cooperating to assure the smooth functioning of the program: State Board of Health, local health board, the local physicians, and, not least to be considered, the public in the affected vicinity. The State Board of Health has its finger on the general poliomyelitis situation in the state and surrounding states and routinely collects statistics of the sort which should be available in a situation of this kind. The local health board carries considerable responsibility in the community, and, with the physicians, would be able to assure the public that the measures instituted are as much in the interests of public welfare as they are for the intellectual exercise and academic amusement of the scientists who are likely to look on with the avidity of men watching an experiment in the physiological laboratory. The cooperation of the local physicians is further needed in the large amount of work in serum collection and injection that one would expect under these circumstances. Without the coöperation of the public in the vicinity, the plan is a failure before it gets under way. Here is one set-up in which full publicity should be given by newspapers and similar means as to the seriousness of the local poliomyelitis situation in order to bring people in for the prophylaxis within a short period of time. Consideration of local commercial interests which sometimes bring pressure to bear in suppressing such facts in order not to disturb business, would tend towards insufficient coöperation on the part of the public, and probably seriously hinder the effectiveness of the measures. In several of the universities of the country there are men especially interested in the poliomyelitis problem. These men might well be used in an advisory capacity in any attempt of this sort to control a given epidemic.

Third, the actual technic in individual families would be a simple matter. We would collect about 25 c.c. of blood each from the father and from the mother for each child to be injected, and mix these two samples. Immediate centrifugation of this blood would yield about 25 c.c. of serum which would then be aspirated into a syringe and injected into the back muscles of the child. In an emergency, whole blood could be used instead of the serum, but twice as much volume would be required for a given quantity of antibodies injected and more foreign material would be injected in the way of blood cells and fibrin, and this material would provoke a much more lasting local reaction, with consequent pain and discomfort. One or more portable outfits of centrifuge, antiseptics, syringes, dressings, and the like should be provided the State Board of Health for immediate transportation to an afflicted area. The cost of such an outfit would probably not exceed $500.00 In the larger communities, much of this material would already be on hand in the hospitals, clinics, and their laboratories. It should here be explained that 25 c.c. of serum is accepted as a proper dose because that is the approximate dose commonly recommended for the treatment of a case of poliomyelitis that has actually begun. In drawing blood from father and mother, it has been shown above that in a certain percentage of the cases we would expect to have immune bodies in the blood of only one of the donors, and this would result in only half a dose. Objections to this cannot be completely answered, but there is no good measure of what constitutes proper dosage anyhow, so it may as well be agreed tentatively that a half dose is better than none.

If, then, these injections can be administered within a period of a few days to the greatest part of the child population, it can logically be hoped, though admittedly it cannot be expected before several trials, that the desired number of susceptibles in the community will have been passively immunized for a time interval longer than the incubation period of the disease, and that therefore the chances of the spread of the epidemic will have been tremendously reduced.

For the sake of clearness, it must be again emphasized that this method is aimed at a single epidemic; if the injections should happen to give that degree of passive immunity which would permit individuals accidentally exposed during this period to go on to a stage of active immunity, the circumstance would be a happy, though largely an unexpected, one. Indeed this brings up the main point of objection that can be raised against this proposal. That is, it might be argued that we are simply increasing the number of susceptibles to provide soil for a more serious situation in a subsequent epidemic by tiding them over a time in which many would otherwise develop an active immunity. The answer is, of course, that there is nothing to prevent the repetition of the method as frequently as is necessary to keep the disease in check.

No attempt is made to summarize this paper as the controversial points are fairly numerous, and an interested reader should examine, think about, and decide on them individually. The writer believes, however, that the suggestions here set forth are sufficiently sensible to warrant an actual trial in the field.

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PRESIDENT'S LETTER

"There Is Nothing Sacred About the Ancient Practice of Private Service for Private Fees."

LAST month the Public Health Education Committee quoted the above in its Forum from a recent official report of the Social Service Conference in Minneapolis.

This pronouncement is an extremely interesting sidelight on the state of mind of the social worker, this new professional in the field of care for the unfortunate. He is full of fine theories, this new professional; of scientific smatterings; of doctrinaire opinion. He knows a little about medicine and is fired with a laudable ambition to force upon the public all he knows and, sometimes, a good deal that he doesn't know about public and private health.

He has encountered difficulties, of course. Old precedent; the indisposition of most men to be forcibly educated into enlightened disease prevention, unwanted medical care and sanitation; economic entanglements and the point blank refusal of the doctors themselves to be drawn into anything that seriously endangers "the ancient practice of private service for private fees"—in other words, the ancient unhampered confidential relation between the doctor and his patient.

It is natural, probably, that he should be impatient at obstacles, particularly impatient at these incomprehensible physicians who are not rejoiced to come out of the small domain of private practice and become officers of the state for imposing their knowledge and skill upon the public.

This public has never been very tractable when it came to imposing ideal procedures of any sort upon it by administrative or legislative act.

The working of prohibition is an adequate example of public rebellion at measures of this sort and with it political graft and organized lawlessness.

The establishment of state medicine, which would inevitably become compulsory state medicine, opens the way to comparable irregularities and misfortunes.

Already the keen eye of the political aggrandizer has seized upon the well meant propaganda of the social worker to his profit. Doubtful laws have been passed in a good many different states, and the charlatans, the quacks and the ism-practitioners are finding their second wind through them.

I am in great hopes that the Medical Economics Committee appointed at our last state meeting will be able to inform us very definitely on everything that relates in Minnesota to the knotty problem of medical costs. There is some better way to deal with the problem of care of the sick than to rush still further into governmental paternalism. But we cannot defend and preserve all that is sacred in "the ancient private practice of medicine" unless we are able to check from authoritative sources the facts and figures of the social worker.

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

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POLIOMYELITIS IN MINNESOTA

This year, instead of the usual relative absence of poliomyelitis cases during the winter and spring months, there were following the epidemic of 1930 twenty-eight cases with six deaths during the first six months. During the last week in July case reports increased rapidly for a total of twenty-eight cases for the month. In August there were 165 cases, and up to September 5 eighteen cases had been reported. This situation calls for alertness on the part of the physician to recognize cases of poliomyelitis, and especially to attempt to make the diagnosis in the preparalytic stage, as the evidence of the beneficial effect of convalescent human serum in the treatment of these cases before paralysis occurs is increasing.

Fortunately the Division of Preventable Diseases of the State Department of Health started preparing convalescent serum in increasing amounts as soon as the situation began to cause uneasiness, and a reasonable amount of serum is still available. As long as the supply lasts serum can be secured promptly by communicating with the Division, preferably by telephoning through the University of Minnesota. Twenty to 30 c.c. is furnished and should be injected intramuscularly as soon as possible. If too much time will elapse through waiting for convalescent serum, whole blood injected intramuscularly is considered of distinct value, as experiments have indicated that in individuals over two years of age who have never had clinical poliomyelitis the blood has protective bodies against poliomyelitis in as high as 50 per cent of the cases. This percentage increases in adult years and is higher in the urban than rural populations.

Stress must be placed upon the use of the serum in the preparalytic stage, which places a great obligation on the physician not to overlook cases of true poliomyelitis and on the other hand not to waste the serum by giving it to patients not suffering from this disease and thus deplete the supply before the need for it has passed.

In the presence of an acute febrile state, especially in a child, if there is evidence of stiffness of the neck, and more especially if there is stiffness and pain in the spine as indicated by having the patient attempt to bend in order to touch his knees to his head, poliomyelitis is the most probable diagnosis. This diagnosis may be made positively if in addition the spinal fluid examination reveals a moderately increased pressure with an increase in cells sometimes as low as 20 or as high as 700 or 800 per cu. mm. These cells at first may be largely polymorphonuclear but later are lymphocytes. The fluid is clear but to transmitted light may have a somewhat "ground glass" appearance. A positive globulin test occurs. No organisms are found. A clear

sensorium in the presence of these findings is helpful in making a differential diagnosis. In any febrile case that continues to be doubtful an early spinal fluid examination is justifiable, especially during an epidemic. If a minimal quantity of fluid is removed aseptically no possible harm can result and may be the means of instituting early treatment. This is not to be construed as a justification for indiscriminate spinal punctures in early febrile states.

Until some early positive diagnostic means becomes available the diagnosis in the abortive and non-paralyzed cases will remain difficult and often impossible, but attention to the above simple rules will be found of distinct value.

It is hoped that the present reduction of mortality and morbidity from the early use of convalescent human serum may continue and that the supply of serum will be entirely adequate for future needs.

E. J. Engberg, M.D.

INCREASING CLIENTELE

We are confronted from time to time with propositions conceived by some individual with an eye to business purporting to increase our field of professional usefulness. Most of us have the laudable desire to increase our clientele but we occasionally have a way of jumping at some tempting bait without careful investigation.

A newspaper man conceives the idea that the local medical profession should receive more publicity and works up the idea of a Sunday supplement array of photographs with an accompanying write-up of the leading members of the local profession—for a consideration.

Or someone gets out a bulletin and to help defray expenses seeks permission over the telephone to include your name—at a nominal charge.

Or a persuasive individual shows you a copy of a directory of experts in the legal and medical profession which has been published for forty or fifty years. You glance it over and sure enough it contains a very select list of the outstanding men in your locality and elsewhere. You are secretly flattered. The cost is moderate. Perhaps something of this sort is just what you should take on. Your true worth is finally coming to be recognized. You sign on the dotted line, later to find that the publication has little organization and no one has ever heard of it.

Or some layman is getting up something new and different—a directory of reliable physicians all over the country. Only those free from commercial taint and recognized by the profession itself are to be included. Data given will be so complete that selection of a physician for reference of patients will be easy. How much demand for such a publication there will be, however, is a matter of speculation.

Whether a medical directory of the professional standing of physicians edited by a layman can possibly be as reliable as one published by a medical organization, is questionable. The American Medical Association has for years published a directory of all licensed physicians which contains useful and reliable information, although admittedly not as complete as might be desired.

A limited directory appears in a number of the state medical journals. Paid insertions resembling professional cards with name, specialty and address appear monthly in the advertising section. This practice falls into the category of local custom and cannot be criticized. We can see some convenience in the method, but most physicians are well acquainted with the profession of the state and state journals have as a rule a limited circulation outside of the state. We imagine few physicians would refer patients on the basis of state journal insertions. Incidentally the practice furnishes an added source of income to the state journal and might be considered by our Association.

These numerous efforts to furnish reliable information as to professional qualifications have more or less worthy motives. Most of them, however, are attempts at forcing the growth of medical practice.

To quote from the "Principles of Medical Practice" of our national association: "The most worthy and effective advertisement possible even for a young physician, and especially with his brother physicians, is the establishment of a well-merited reputation for professional ability and fidelity. This cannot be forced but must be the outcome of character and conduct."

The newspaper publicity mentioned is, after all, direct advertisement. Directory insertions, while not strictly unethical, are probably of little value as a means of increasing one's practice.

CORONARY THROMBOSIS

The practical importance of the recognition of coronary thrombosis lies in the need for pro-

longed rest following the attack. As far back as 1912 Herrick described the clinical symptoms due to coronary occlusion, but it was not until recent years that the diagnosis became common.

The picture once recognized, the diagnosis is not difficult. The ashen complexion, weak and rapid pulse which may be one characteristic of fibrillation, the low blood pressure, and the pain, cardiac in distribution, form a syndrome which often is unmistakable. The pain may be precordial or epigastric, and may be agonizing or simply a distress, and is of longer duration than that of a typical angina pectoris, lasting sometimes for hours instead of minutes and often requiring more than one hypodermic of morphine for control. Vomiting associated with the pain is not unusual and is likely to draw the attention of the attending physician to the digestive system. A moderate elevation of temperature and leukocyte count after twenty-four to thirty-six hours confirms the diagnosis. The development of a pericardial friction rub or a stroke some two or three weeks later clinches the clinical diagnosis.

The electrocardiogram is a refinement in diagnosis which, though not essential, is usually confirmatory, showing as it usually does a gross disturbance of the myocardium. The high take-off of the T wave from the down-stroke of the R wave or its low take-off from the up-stroke of the S wave are likely to be present in the acute stages. In later records an upwardly convex S-T interval and negative T waves are likely. The electrocardiogram may return to normal with convalescence.

As the accident follows a coronary sclerosis the history generally brings out significant data. The patient has had symptoms attributable to arteriosclerosis—perhaps typical attacks of angina pectoris, evidence of poor myocardial response, intermittent claudication, or he (usually it is he) is at that age at which arterial degeneration is to be expected. Instances below the age of forty are comparatively rare.

Rest over a period of six weeks or more is most important. Rest and sedatives are the most essential treatment. Digitalis is probably not indicated in the absence of congestive heart failure and in some instances may be actually harmful. In the presence of heart block barium chloride has been recommended.

It is surprising with the increasing frequency of diagnosis how many patients recover from an attack in spite of the necessarily severe damage to the heart muscle. Location of the infarct and the size of the thrombosed vessel have an important bearing on the final outcome.

Before the clinical picture of coronary thrombosis came to be recognized by the surgeon as well as the internist, patients not infrequently underwent laparotomies due to mistaken diagnoses. Many reported dying from acute indigestion doubtless have been the victims of coronary thrombosis. With the syndrome in mind the diagnosis is comparatively simple.

HIBBING AND THE NORTHERN MINNESOTA MEDICAL MEETING

More than eighty practitioners of Medicine registered at Hibbing and attended the fine day's session of the Northern Minnesota Medical Association. Despite the depression and oppression, the attendance from such a wide area was, as ever, a fine indication of most doctors' zeal for instruction and organization, and enjoyment in fraternizing with their fellows.

Hibbing has much of interest to show its guests and visitors: a noonday trip on flat cars through the enormous open pit mines was a thriller equal to a review of the Panama Canal, with which comparative figures of earth movement are so often made.

The selection of Dr. G. S. Wattam of Warren for president brought to a most distinguished pioneer a much merited honor, and to the society a pledge of continued farsighted leadership.

No one can see in such amplified sectional meetings, or what are virtually yearly assemblages of contiguous county society groups, any interference with the purposes or prerogatives of the State Association. It seems necessary at times to reiterate this opinion because the notion abounds that defections, through hospital staff meetings, special groups, or the great colleges, detract interest and support from the official groups leading up to the American Medical Association. This notion is not denied by those who neither attend hospital staff meetings nor like them; men who are supposed to remain away from state and American Medical Association meetings because they ingest medical pabulum to satiety at home. Go to all these meetings, and you will find the sturdy veterans in the benches at all the good meetings. To locate the rest, for present or future, is not the purpose of this editorial.

E. L. T.

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

Concerning the New Plan for Veterans Aid

The recently created Auxiliary to the Committee on Legislative Affairs occupied itself at a recent Chicago meeting with the so-called Shoulders Plan for disability insurance for veterans. This plan originated with H. H. Shoulders of Tennessee in the House of Delegates meeting held in June.

Following is a brief recapitulation of the Committee discussions, a complete report of which, together with recommendations for a campaign to promote the plan as a substitute for the present federal hospitalization plan, will be ready for publication shortly:

Veterans hospitals as now administered are full of veterans who have been completely and needlessly removed for long periods from their families.

Other equally deserving veterans have been totally unable to avail themselves of the medical service due them because they have refused to leave their families under such conditions.

Under the new plan for disability insurance there would be no need for the veteran to abandon his family in order to avail himself of his legitimate government aid. He would not even be obliged to leave his job unless his condition actually required hospitalization, in which case he could be hospitalized at an institution of his own choice near his own home.

At the present time there are some 220,000 empty beds in civilian hospitals in this country. The hospitals are inevitably handicapped, their efficiency reduced. Removal of veterans from their local communities is constituting an inceasingly serious problem to hospital administrations in their endeavor to maintain high standards of service at a price the general public can afford to pay.

Taxpayers are being unnecessarily taxed to pay for additional unnecessary beds in government hospitals while local institutions struggle with the problem of operating with 40 per cent of their beds vacant.

Doctors Pick 4-H Club Winners

On Tuesday, September 8, the Public Health Education Committee coöperated with the University Farm School and the Minnesota Public Health Association in examining nearly 100 4-H Club contestants for the boys' and girls' health championships of Minnesota. Ten specialists, under the direction of E. A. Meyerding, Executive Secretary, examined and graded the contestants at the 11 West Summit Avenue headquarters of the Minnesota State Medical and the Minnesota Public Health Associations. They reported, among all of these farm boys and girls, a remarkably high level of physical development. The finest specimens of all, however, and the highest score sheets, appeared wherever the medical profession had participated in the preliminary county contests. The winners were Geraldine Kohler of Windom and Clint Peterson of Worthington. Bernice Olson of Fulda, second highest among the girls, will go to Chicago with Clint Peterson in December to represent Minnesota in the national contest, because Geraldine Kohler is only thirteen years old and a year too young to be eligible for the trip.

As a rule the girls showed better physical condition, better posture and better grooming than the boys according to the examining experts. Such hunched shoulders and hollow chests as appeared among them were thought to have been caused by tight brassieres worn to achieve the flat figure which, until recently, led the styles.

It was worthy of note that the bunions, calluses and small calves usually noted among young people of this age were almost entirely absent. The ages of the girls examined ranged from thirteen to twenty, the boys from twelve to eighteen.

OF GENERAL INTEREST

Dr. C. M. Adkins has moved from Grygla, Minnesota, to Thief River Falls, Minnesota.

Dr. V. J. Telford, formerly of Edgerton, Minnesota, is now located at Litchfield, Minnesota.

The next meeting of the Association of Resident and Ex-Resident Physicians of The Mayo Clinic and The Mayo Foundation will be held October 8, 9 and 10.

Dr. A. A. C. Nickel, formerly of the Mayo Clinic, Rochester, Minnesota, has moved to Bluffton, Indiana, and is associated with the Caylor and Nickel Clinic there.

Dr. W. H. von Lackum, for the past eight years associated with the Section on Urology of the Mayo Clinic, has recently left Rochester. He has located in New York City, where he has entered training in preparation for the practice of orthopedic surgery. His address is 135 Slocum Crescent, Forest Hills, Long Island.

Dr. Ira M. Roadman, who has been in the Indian Service at Ponsford, Minnesota, for the past twelve years, is retiring from the Service to engage in general practice. Dr. Roadman's stay at Ponsford is considered a record for length of service of any physician at one station in the Indian Service. He has moved to Minneapolis where he expects to open an office soon.

Dr. Fred J. Pratt of Minneapolis attended the meeting of the American Academy of Ophthalmology and Otolaryngology, held at French Lick Springs, where he taught at the Section of Instruction, which was held in conjunction with the meeting.

Dr. John A. Pratt also attended the American Academy meeting, where he gave a paper on "Atrophic Rhinitis."

The Polk County Medical Society sponsored a joint meeting of the Friendly Valley County Medical Societies, at the Osceola Hotel, Osceola, Wisconsin, on September 23, 1931.

The periodic health examination was the subject of discussion and an actual examination illustrated it. Among the speakers were: R. G. Leland, Director, Bureau of Economics, American Medical Association, Chicago; W. A. O'Brien, Pathologist, University of Minnesota, Minneapolis, and C. B. Wright, Minnesota Delegate to the American Medical Association, Minneapolis.

A six o'clock dinner was served.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

SAINT PAUL QUACK PLEADS GUILTY TO VIOLATING BASIC SCIENCE LAW

State of Minnesota *vs.* Lobac

Charles Lobac, thirty-seven years of age, who claims to be a barber from Fresno, California, entered a plea of guilty to violating the Basic Science Law in the District Court at St. Paul before the Honorable Gustavus Loevinger, Judge, August 6, 1931. The defendant was arrested at Sixth and Wabasha Streets in St. Paul, where he plied his trade of selling a preparation called "Radian." The charge was one dollar per bottle, and the compound was alleged to cure everything from cancer to loose teeth. After spending six days in the county jail, the defendant heard the call of the harvest fields, entered a plea of guilty and was sentenced to thirty days in the St. Paul workhouse. The sentence was suspended after the defendant made an earnest plea to the Court that he be given a chance to leave the state and work in the harvest fields.

Mr. Brist reports that the State Board of Medical Examiners received very splendid coöperation from Detectives Tuckner and Johnson attached to the office of Michael F. Kinkead, county attorney, as well as from the county attorney's staff. Judge Loevinger very firmly informed the defendant that the practice of healing was intrusted to only those well educated and trained in that direction. No further trouble should be had with this defendant.

SECOND OFFENDER RECEIVES ONE YEAR IN WORKHOUSE

State of Minnesota *vs.* Ebeling

The above defendant, E. F. C. Ebeling, sixty-five years of age, who on June 10, 1931, entered pleas of guilty to violating the Basic Science Law and the Statute against distributing circulars and pamphlets on the restoration of lost manhood and other ailments, was committed to the Minneapolis Workhouse for a period of one year on September 8, by the Hon. Mathias Baldwin, Judge of the District Court.

Ebeling paid a fine of $100 in June for violating the Basic Science Law and received a suspended sentence of one year in the Workhouse for distributing the pamphlets. On August 23, Ebeling inserted an advertisement in the Minneapolis Tribune informing the public that he had the "new and right way to help Rheumatism, Stomach, Bronchial Asthma, Hay Fever, etc." He was arrested the next day on a complaint filed by Mr. Brist, representing the State Board of Medical Examiners, with the foregoing result. This means that Ebeling will spend the next twelve months in the Workhouse and undoubtedly it will "cure" the defendant of any desire to practice healing without a license, which should also serve as a warning to others similarly situated.

A very splendid attitude was shown in this case by Mr. Howard R. Hush, Chief Probation Officer, Hennepin County, and Mr. Archie Helwig, Deputy Probation Officer. Judge Baldwin is also to be commended for the prompt revocation of the suspended sentence. This indicates very clearly that quacks are going to receive

some stiff jail sentences for repeated violations of the Medical Laws of this State.

ITINERANT PHYSICIAN SENTENCED TO SIX MONTHS IN COUNTY JAIL

State of Minnesota *vs.* John Edmund Doran

On Friday, August 21, 1931, the above defendant, John Edmund Doran, fifty-nine years of age, a licensed physician in the State of Minnesota, entered a plea of guilty to practicing medicine as an itinerant physician without a license before the Honorable Julius E. Haycraft, Judge of the District Court at Albert Lea, Minnesota.

For the past several years Dr. Doran has made a practice of traveling about the State of Minnesota and maintaining an office temporarily in hotels where he received patients after having advertised in the local newspapers his contemplated visit to the community. Among the towns where Dr. Doran maintained an office are Mankato, Winona, St. Cloud, Canby and Albert Lea. Dr. Doran was arrested on August 11, on a complaint filed by Mr. Brist, representing the State Board of Medical Examiners. The defendant waived his hearing and was held to the District Court under $1,000 bail. Dr. Doran finally decided to plead guilty with the foregoing sentence. Judge Haycraft suspended the sentence upon several conditions, the important one being that Dr. Doran is to refrain absolutely from practicing medicine in this state in more than one town. Dr. Doran is registered with the Board as maintaining an office at 335 Boston Block, Minneapolis.

OBITUARY

Henry J. O'Brien

1862-1931

Dr. Henry O'Brien, for years one of the leading surgeons in Saint Paul, died at his home September 16, 1931, following a stroke.

Born in Bayfield, Wisconsin, April 21, 1862, the son of Mr. and Mrs. Dillon O'Brien, he was brought to Saint Paul as a child, where he attended the public and parochial schools. The youngest in the family of one of the early settlers in the Madeline Island region, Dr. O'Brien returned for vacations frequently to his summer home on the island.

After receiving his medical degree from the University of Pennsylvania in 1888, he served as the second interne at St. Joseph's Hospital, Saint Paul, the first interne having been the late Dr. Arthur J. Gillette.

As a young man he became associated with Dr. Charles E. Smith and Dr. Everton J. Abbott. As years went on he showed his kindly interest in others of his profession by sharing his office and experience with a number of younger surgeons. Many a younger member of the profession could tell of instances of his generosity, which was one of his outstanding qualities. One of the first in Saint Paul to specialize in surgery, Dr. O'Brien enjoyed a well merited and extensive practice.

Early in his professional career Dr. O'Brien married Miss Mary King of Saint Paul. Three years after her death in 1909, he married Miss Caroline M. Beaumont, who survives him. He is also survived by two sons, Wallace D. O'Brien and Everton J. D. O'Brien, both of Saint Paul; one brother, Honorable Thomas D. O'Brien; two sisters, Miss Mary O'Brien and Mrs. Stan Donnelly, Sr.; and two grandchildren.

Dr. O'Brien was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the Minnesota Academy of Medicine.

W. L. Klein

Mr. William Livingston Klein, publisher of *The Journal Lancet* for over forty years and a resident of Minneapolis since 1881, died at his home August 20, 1931.

Borne in Barry, Illinois, on January 28, 1851, he attended Phillips Academy and Cornell University. After graduation from college he became head of the Normal School at Avon, New York, and while there, was married to Nora C. Sprague, daughter of a Syracuse judge. After being principal of a school in Woodstock, Illinois, he founded a book publishing company in Chicago, which still carries his name.

Moving to Minneapolis in 1881, partly on account of Mrs. Klein's health, he became the publisher of *The Journal Lancet* (then known as the *Northwestern Lancet*) in December, 1887. Two years before his death, on account of ill health, he sold the publication to the Cohen brothers.

Although known as a publisher, he was an able editor in addition. The tone of his publication attests the fact. His keen analytical mind is shown by his book entitled "Why We Punctuate or Reason Versus Rule in the Use of Marks," the second edition of which appeared in 1916, the first edition having appeared in 1896.

Mr. and Mrs. Klein were among the founders of the Trinity Baptist Church in Minneapolis and were very active in its progress. Mr. Klein is survived by his wife and two sons, Kenneth O. Klein of Minneapolis, and Horace C. Klein, president of the Webb Publishing Company of Saint Paul.

ARSPHENAMINE AND NEOARSPHENAMINE

Comparisons of the therapeutic value of arsphenamine and neoarsphenamine must take into account the difference of arsenical content, which is one-third higher in the case of arsphenamine than in the case of neoarsphenamine. Even allowing for this difference, it is quite generally conceded that arsphenamine as such is therapeutically the more effective than neoarsphenamine. The evidence for the efficiency of neoarsphenamine is conspicuously small. The most carefully investigated and reported clinical material has been treated with arsphenamine rather than with neoarsphenamine. One of the characteristics of neoarsphenamine, which will affect any attempt to estimate its gross clinical value, is the marked variability between different lots of the preparation, even from the same manufacturer. (Jour. A. M. A., August 15, 1931, p. 480.)

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question*—Please send me information concerning poliomyelitis. I am particularly interested in the use of convalescent serum, where it may be obtained, how much to give, and its probable effect.

Answer—Acute anterior poliomyelitis is a pathological misnomer to a certain extent. The usual after-effects represent chiefly the involvement of the anterior horn cells. The pathologists see an entirely different lesion at necropsy. There is involvement of the anterior horn cells, diffuse and focal myelitis and usually meningitis and encephalitis. Many of the fatal cases show bulbar lesions but death is more frequently due to paralysis of the cervical and thoracic regions.

The term infantile paralysis also fails to accurately state the case as the disease is rare in true infancy. The disease usually occurs in the young but may be found at any age. The peak of incidence is usually in the fall and frequently subsides with the coming of cold weather. There are also exceptions to this rule as the disease may persist well into the fall and may occur at any time of the year. The outbreak in the fall is frequently associated in many minds with the opening of school. This is probably not true.

The disease occurs in both the paralytic and non-paralytic forms and most observers believe it is due to a virus. When the virus of poliomyelitis is mixed with pooled serum from the general population, it is found to be approximately 80% efficient in protecting monkeys from cerebral inoculations. This seems to indicate that a large percentage of adults have had the non-paralytic form of the disease at some time in the past. At the same time the paralytic poliomyelitis is present, there are numerous cases of ill-defined maladies in the community. These are usually interpreted as non-paralytic forms of the infection in the light of our present knowledge.

The pre-paralytic symptomatology is not characteristic. It may mimic any one of several minor forms of general disturbance. Fever is usually present. The patient may have a sore throat, gastro-intestinal upset, malaise, general muscular soreness, spinal rigidty, headache, neck rigidity, positive Kernig's sign, or other complaints. Convalescent serum is most effective when given in the pre-paralytic stage. It may be obtained by getting in touch with the Division of Preventable Diseases of the State Board of Health in Minneapolis.

Anti-bodies apparently persist after infection. It does not seem to make very much difference how much time has elapsed since the donor had the disease. The serum is usually pooled but individual donors may be used and approximately 20 to 30 c.c. are injected intramuscularly into the buttocks. Its value is very difficult to ascertain because of the difficulty in making a diagnosis before paralysis develops and because the paralysis shows spontaneous tendency to improve. It should be used in selected cases with these reservations.

In some epidemics, epidemiologists insist on an increased spinal fluid cell count before it is given. While meningeal involvement is usually present, it may be absent or mild in degree. When paralysis of the muscles of respiration develop, the Drinker apparatus is used for the purpose of augmenting the patient's own efforts at respiration. It is not in any sense a curative measure but simply acts as a mechanical aid. If the disease does not progress, it is most helpful in maintaining life. Paralysis is seldom the initial symptom and is usually preceded by an illness of varying time and severity. All patients with swallowing difficulties should be considered suspect poliomyelitis cases until proved otherwise. In case of doubt, physicians should communicate with the Division of Preventable Diseases for advice and assistance. All patients who have recovered from poliomyelitis should be encouraged to offer their blood for the collection of convalescent serum. Paralytic cases should have the affected parts placed in some type of corrective device to prevent deformity. Whether motion should be started early or late is still a matter of conjecture and well-informed men will be found on both sides of the question.

2. *Question*—I recently purchased a Sahli hemoplobinometer. The circular which accompanied it stated that 100% represented a different amount of hemoglobin than I was accustomed to use in terms of grams in each 100 c.c. How is it possible to convert this figure?

Answer—It is usually best to standardize each tube and to disregard the manufacturer's statement as to the amount represented on the scale. This may be done by accurately counting the blood of five or ten persons with an average of 5,000,000 cells per cubic millimeter. The average hemoglobin reading of the group should be taken as 100% and the correction used for all the figures.

3. *Question*—What is the latest treatment for the correction of so-called "trench foot" in the army?

Answer—I assume you mean by "trench foot" the condition also known as "athelete's foot" or "epidermophytosis." If the lesions are acute or weeping the best treatment is a pack of 1-4,000 solution of potassium permanganate, and bed rest. When the condition is under control, it may be treated as a chronic affair. The best treatment at this stage is Whitfield's ointment, half or full strength, applied twice daily. Full strength of Whitfield's ointment is salicylic acid 2, benzoic acid 4, and petrolatum 30 (metric).

It is rather difficult to predict the outcome as re-infection is difficult to avoid. If the patient can boil his socks, change his shoes frequently, and avoid stepping on affected floors, *e.g.*, swimming pools and gymnasium, a cure is possible. It is a difficult persistent disease to treat and many things have been tried. Some of these remedies advertised directly to the laity are not a cure-all. Many articles have recently appeared concerning this disease and if the above treatment is not effective, please write again.

COMMUNICATION

Terre Haute, Indiana
June 20, 1931

Dear Sirs: Re: Goiter Classification and Nomenclature.

This association would appreciate very much your giving wide publicity to its approval of the following classification and nomenclature:

Clinical Classification:

Type 1—Non-toxic Diffuse Goiter
Type 2—Toxic Diffuse Goiter
Type 3—Non-toxic Nodular Goiter
Type 4—Toxic Nodular Goiter

Nomenclature:

Our association advocates a policy of using the simplest and yet the most descriptive terminology possible.

The use of proper names, while it is impossible to dispense with many well established ones in goiter literature, be discouraged; as should coined words invented to popularize a fad or fancy.

Emphasis should be made upon the importance of not confounding varieties and sequelæ with types. The use of such terms as exophthalmic, hemorrhagic, cystic, adolescent, colloid, intra-thoracic, substernal and congenital are perfectly proper when used to describe varieties, but only constant characteristics should be used to designate types.

Thanking you very much for your cordial coöperation, I am,

Fraternally yours,
AMERICAN ASSOCIATION FOR THE STUDY OF GOITER,
J. R. YOUNG, M.D., *Corresponding Secretary.*

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of October will be as follows:

October 7—Corneal Ulcer
October 14—Prevention of Hay Fever
October 21—Cretinism
October 28—Brain Tumor

MINNESOTA MEDICAL ALUMNI ASSOCIATION HOMECOMING PROGRAM

The homecoming football game will be the occasion for the return of many medical alumni to Minneapolis. The committee of the Medical Alumni Association is again making it possible for the returning alumni to enjoy a worthwhile scientific program in connection with their visit.

At 9 A. M., Friday, October 30, 1931, the day preceding the game, the following program will be presented at the Eustis Amphitheatre in the University Hospital:

Dr. J. F. CORBETT, Minneapolis, presiding

Oral Cholecystography—J. R. AURELIUS, St. Paul

Pediatric Clinic—IRVINE MCQUARRIE, Head of Department of Pediatrics, Medical School, University of Minnesota

Skin Lesions (demonstration by lantern slides)—JOHN BUTLER, Minneapolis

The Present Status of Surgery of the Gall Bladder—E. STARR JUDD, Rochester, Minn., President, American Medical Association.

Blood Pressure in Relation to Insurance Examinations—C. NAUMANN MCCLOUD, St. Paul Medical Director Minnesota Mutual Life Insurance Co.

Practical Demonstration of Varicose Vein Injection—J. M. Hayes, Minneapolis.

Luncheon at 12:00 o'clock, at which time Dr. Richard E. Scammon, Dean of Medical Sciences, University of Minnesota, will speak.

The delegates will meet for the annual business meeting of the association at this time.

Dr. C. N. Hensel, St. Paul, will preside at the afternoon session, which will convene promptly after lunch and the business meeting, with the following presentations:

Orthopedic Clinic—WALLACE H. COLE, St. Paul

Pain in Gynecological Diagnosis—S. B. SOLHAUG, Minneapolis

The Unimportant Heart Murmur—S. MARX WHITE, Minneapolis, President, American College of Physicians.

Thoracic Surgery in the Treatment of Tuberculosis—T. J. KINSELLA, Glen Lake Sanatorium.

Neurological Gaits and Other Conditions (demonstration with moving pictures)—J. G. MCKINLEY, Professor of Nervous and Mental Diseases, Medical School, University of Minnesota

RED RIVER VALLEY SOCIETY

The Red River Valley Medical Society will meet at Thief River Falls, Tuesday, October 6. Speakers scheduled are: W. A. Fansler, Minneapolis; E. A. Meyerding, St. Paul; J. A. Myers, Minneapolis, and Mrs. S. S. Hesselgrave, St. Paul, who will address the Auxiliary.

Dr. Myers' subject will be "Tuberculosis." Dr. Fansler will talk on "Rectal Difficulties." Dr. Myers will also address a luncheon meeting at Thief River Falls on the same day.

DODGE COUNTY SOCIETY

The Mantoux tuberculin test will be discussed at a meeting of the Dodge County Medical Society to be held at Kasson on Friday evening, October 9, in the office of F. D. Smith.

Dr. J. A. Myers, Minneapolis, and Dr. E. A. Meyerding, St. Paul, will talk.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Dr. Charles C. Allen of Austin was chosen president of the Southern Minnesota Medical Association at the annual convention held at Faribault, Minn., August 25.

Others elected are Dr. R. V. Williams, Rushford, first vice president; Dr. B. J. Gallagher, Waseca, second vice president, and Dr. M. C. Piper, Rochester, secretary-treasurer.

Medals were presented to Dr. W. P. Herbst of Minneapolis and Dr. R. K. Ghormley and Associates of Rochester for the best individual scientific exhibits at the State Meeting this year, and to Mr. T. C. Erickson, a senior medical student at the University of Minnesota, who in his junior and senior years was selected as having shown the highest degree of efficiency in the clinical fields of medicine and surgery.

JOINT MEETING OF CHISAGO-PINE AND CENTRAL MINNESOTA DISTRICT SOCIETIES

The question of amalgamation was discussed by the Chisago-Pine and the Central Minnesota District Medical Societies at Cambridge, on Thursday, September 17. Visiting speakers were: E. A. Meyerding, St. Paul; W. A. Coventry, Duluth; F. J. Savage, St. Paul, and Mrs. S. S. Hesselgrave, St. Paul.

D. E. McBroom, Cambridge, Superintendent, State Colony for Epileptics, acted as host for the meeting which was held at the Cambridge institution.

NORTH CENTRAL BRANCH OF THE AMERICAN UROLOGICAL ASSOCIATION

The eighth annual meeting of the North Central Branch, American Urological Association, will be held in St. Paul, Thursday, Friday and Saturday, October 29, 30, and 31, 1931.

Headquarters will be at the Lowry Hotel. The papers of the scientific program will be presented in the Ramsey County Medical Society assembly room, Thursday forenoon and afternoon, October 29, and Friday afternoon, October 30.

One afternoon session will be devoted to "Obstruction of the Upper Urinary Tract," for which Dr. Frank Hinman, San Francisco, will make an introductory address. The other afternoon session will be on "The Myoneural Mechanism of the Urinary Tract," for which Drs. James Learmonth and William F. Braasch, Rochester, will make introductory addresses.

Members of the Ramsey County Medical Society are cordially invited to attend.

Clinical demonstrations and urologic operations will occupy Friday forenoon at the Ancker Hospital, Saint Paul, and Saturday forenoon at the University Hospital, Minneapolis, and Glen Lake Sanatorium.

Dr. Frederic E. B. Foley, secretary, 229 Lowry Medical Arts Building, St. Paul, is in charge of arrangements.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

RAMSEY COUNTY AUXILIARY

The Ramsey County Auxiliary acted as hostesses to the visiting women attending the Mississippi Valley Tuberculosis Conference, September 21, 22, and 23. They had charge of a Registration Desk and held a tea, Tuesday, September 22, in the new Club Rooms of the Ramsey County Medical Society. A drive and golf were scheduled for the visitors. Women from eleven states attended the meetings. Mrs. W. H. Hengstler, as President of the Auxiliary, was assisted by the Hospitality Committee, Mrs. Edward Schons, Chairman, in the entertainment of visitors.

HENNEPIN COUNTY AUXILIARY

The Hennepin County Auxiliary opened their fall program with a talk by Dr. C. E. Rudolph on "The Cost of Medical Care," September 23, in the Club Rooms of the Hennepin County Medical Society.

The Hennepin County Auxiliary will take over the serving of luncheons again this fall, beginning with the October meeting of the doctors. Mrs. Stephen Baxter will be the general manager.

The Hennepin County year book just published promises an interesting program for the year. In October a Reciprocity Meeting will be held with two auxiliary artists presenting the program. Mrs. W. E. Patterson will read "The Flattering Word," a one act play by George Kelley, and Mrs. Harold Boquist will entertain the audience with musical numbers. Dr. Mabel Ulrich will talk on "Books" at the November meeting, and Mrs. E. G. Wanous will give one of her interesting book reviews at the Christmas Silver Tea. In January, the Auxiliary members are to have a "Great Day," when Mrs. Walter J. Marcley will talk about the Disarmament Conference.

SCOTT-CARVER COUNTY AUXILIARY

Scott-Carver Auxiliary will have a dinner meeting at the home of the president, Mrs. Simmons, in Chaska, Tuesday evening, September 8. A health movie program, with a health talk, will be the evening's entertainment. The doctors will meet the same evening for their regular business.

NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

SANDOZ CHEMICAL WORKS, INC.
Gynergen Solution 0.1 per cent

E. R. SQUIBB & SONS
Squibb Chocolate Vitavose

WINTHROP CHEMICAL CO., INC.
Skiodan

Elixir No. 229 Ephedrine Sulphate 2 grains.—It contains ephedrine sulphate-Lilly (New and Non-official Remedies, 1931, p. 177), 0.44 Gm. in 100 c.c. (2 grains per fluidounce) in a menstruum composed of alcohol, glycerin, sucrose and water, with flavoring agents. Eli Lilly & Co., Indianapolis.

Ventriculin, 100 Gm.—Each bottle contains 100 Gm. of ventriculin (New and Non-official Remedies, 1931, p. 238). Parke, Davis & Co., Detroit. (Jour. A. M. A., August 8, 1931, p. 391.)

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Kellogg's Rice Krispies (Kellogg Co., Battle Creek, Mich.).—A ready to eat, cooked and toasted rice cereal flavored with malt syrup, sugar and salt. It is claimed to be a delicious, cooked, easily digested cereal.

Embo (Purified Wheat Embryo or Germ) (General Mills, Inc., Minneapolis).—Wheat embryo or germ practically free of bran or other parts of the wheat berry hermetically sealed in cans. It is claimed that the product retains the food value and vitamin content of natural wheat germ or embryo which is not modified in manufacture by any heating, bleaching or other process. Unless otherwise prescribed it can be conveniently ingested with minimum loss of vitamin potency by mixing with cereals, vegetables, fruits, after these have been cooked. (Jour. A. M. A., August 1, 1931, p. 321.)

Mazola (Corn Products Refining Company, New York City).—A canned refined corn oil. It is claimed to be a highly refined corn oil for baking and table uses.

Tea Table Sandwich Bread (Sliced) (Liberty Baking Company, Pittsburgh, Pa.).—A white bread made by the sponge dough method, in sliced loaf form. It is claimed to be a bread of good quality.

Liberty Delicious Bread (Liberty Baking Company, Pittsburgh, Pa.).—A white bread made by the sponge dough method. It is claimed to be a bread of good quality.

Liberty Grade A Bread (Liberty Baking Company, Pittsburgh, Pa.).—A white milk bread made by the sponge dough method. It is claimed to be a bread of good quality. (Jour. A. M. A., August 15, 1931, p. 463.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

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MEDICINE

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ROENTGENOLOGY

Leo G. Rigler, M.D.
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J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

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EYE, EAR, NOSE AND THROAT

NEURO-OTOLOGICAL OBSERVATIONS IN CONCUSSION OF THE BRAIN: F. H. Linthicum and C. W. Rand (Arch. Otolaryngology. 13: June '31, p. 785). A series of thirty-six cases is reported in each of which some abnormality of the vestibular response was elicited. The authors refer to vertiga as being of two types:

1. A true or systematized vertigo in which external objects appear to revolve around the subject in a definite direction. This type is usually considered to originate in the end-organ and is often associated with spontaneous labyrinthine phenomena such as nystagmus, past-pointing, and characteristic disturbances in station.

2. False, or non-systematized vertigo, which may be simply a feeling of uncertaining or confusion. The lat-

ter form of equilibratory disturbance may be caused by ocular disturbances or intracranial lesions involving the vestibular tracts, or may be due to so-called neurasthenic vertigo. In other words, it does not originate in the end-organ, but may be the result of a derangement of the ocular, tactile, or joint muscle-sense or a combination of any of these.

The examination of the vestibular apparatus consisted of the turning tests and caloric mass irrigation. Independent neurological examinations had been made in most cases. The authors stress the importance of an accurate history, stating that it plays no small part in the final determination of the extent of injury and the consequent prognosis.

No definite statement is made of the actual number of these 36 cases in either group of the above mentioned classification. Only 6 persons failed to show some hearing impairment of the receptor or inner ear type manifested by the usual shortening of bone conduction and loss of acuity for high notes.

The authors conclude that in practically all cases of cerebral concussion, the patient complains of some form of equilibratory disturbance which may be demonstrated by some abnormality in neuro-otological observations. These observations are usually indicative of mixed central and end-organ damage rather than the involvement of the end-organ alone. The most constant observations are abnormalities in the past-pointing reactions. Traumatic equilibratory disturbances arising in the end-organ are more apt to readjust themselves than those of central origin.

LAWRENCE R. BOIES.

THE CONTROL OF MYOPIA: Edward Jackson, M.D., D.Sc., F.A.C.S., Denver, Colorado (Amer. Jour. of Ophthal., Vol. 14, August, 1931, No. 8). The author starts this article with the statement that "Control of Myopia is practical, cure is not; and prevention is still in the future."

He then gives a review of the literature which in the past has for the most part been "theoretic and philosophic."

The author observes that excessive convergence without accommodation is the most important factor in progressive myopia, and that our most valuable therapeutic measure is the restoration, as early as possible, of the normal relation of these two functions. That myopia causes four per cent of the cases of blindness of both eyes and is liable to lead up to other causes, such as choroidal atrophy, detachment of the retina and cataract.

He then gives his observations taken from the examination of the records of all myopia in his private practice of over thirty years. Among patients under twenty-five years of age, when first seen, the time of life when myopia is most likely to develop and be progressive, were found seventy-seven cases, 154 eyes, which were examined after at least three years of wearing constantly their full correcting glasses.

These patients were under observation from three to thirty years, averaging the age of sixteen when first seen, and twenty-five at the date of last observation.

Of the 154 eyes there were twenty-seven that became less myopic. There were forty-four eyes that showed no change of refraction. There were fifty-two eyes in which the myopia increased less than 1 D. There were thirty-one in which it increased 1 D., or more, the average being 2 D. That is, under the constant wearing of full correcting glasses, 45 per cent of the eyes showed no increase of myopia at any time; 34 per cent showed an increase of less than 1 D., and only 21 per cent showed an increase of 1 D. or over, an average increase of nearly 2 D.

The enormous statistics showing the increase of myopia during school life and all careful observations of its course from Sir Charles Blagden in the 18th Century to the present day, indicate that the development and increase of myopia depend on convergence of the eyes for near work, and that avoidance of such convergence, by occupation and the use of concave lenses, is the foundation of its rational control.

For the common, most important form of axial myopia the program includes:

1. Avoidance of much use of the eyes for near seeing in early childhood, during the period of most rapid development and growth, up to six to ten years.
2. Testing the vision and examining the eyes of children entering school, especially for ocular defects that will lead to excessive convergence. Such testing should include accurate measurement of ametropia.
3. Watching the children in school to secure an erect posture and keeping of the book away from the eyes. Good print and good illumination both in school and in the home. Foerster showed that the home work done with the eyes was greater than the work in school.
4. Sight-saving classes for children having poor vision, or suffering from any ocular condition that would be seriously aggravated by ordinary school work. Each of these children should be placed in such a class on the advice of an oculist, who should see the child every three months, so long as the sight-saving supervision was necessary. In such a class the child should spend a part of the day in the special room for sight-saving instruction, and a part receiving oral instruction with seeing children of the same grade.
5. The constant wearing of accurate correcting glasses, especially of full strength concave glasses.
6. Regular daily, outdoor living and exercise; for children, youths and young adults.
7. Close attention to the child's general health and nutrition, including care as to vitamins, and endocrine secretions. As to hereditary and congenital myopia, this may need to be extended to the care of the expectant mother.

Such a program intelligently carried out would prevent most cases of myopia, would limit to low degree most of the cases that did arise, would prevent the degenerative changes that characterize the later stages of high myopia, and would prevent about four per cent of the blindness that now occurs in civilized countries.

L. G. CULVER, M.D.

MEDICINE

TUBERCULOSIS ABSTRACTS*

Collapse therapy in tuberculosis is now an established procedure of unquestioned value. Clive Riviere said: "No more hopeful ray of sunshine has ever come to illumine the dark kingdoms of disease" than artificial pneumothorax. This therapeutic procedure, however, has its limitations. Mechanical difficulties brought on by the pathological condition of the lung often make collapse by the insufflation of air or gas impossible or ineffective. Latterly, the injection of oil into the pleural cavity for certain cases has found favor, especially among French phthisiologists. Somewhat timidly, oleothorax is being introduced and practiced in this country. From an article by L. E. Oppengame in the *American Review of Tuberculosis,* June, 1931, the following abstracts are derived.

Oleothorax

Oleothorax is the injection of mineral or vegetable oil into the pleural cavity. The indications for its use are: to avoid adhesions, to produce a more effective collapse when pneumothorax is ineffective, to give more rigidity to the pleura if a bulging of the mediastinum occurs, to close a perforation of the lung, to change an empyema into a sterile disinfectant oil. In rare cases, it may be used instead of artificial pneumothorax when for any reason a patient cannot return for routine refills.

According to Fontaine's statistics, about 70 per cent of pneumothorax treatments are complicated by pleurisies, 22 per cent result in empyema, and 15 per cent make further collapse therapy impossible because of resulting adhesions. The reason pneumothorax continues to be used in the face of these troublesome sequelæ is because not all pleurisies are intoxicating for patients and a great number are beneficial for pulmonary tuberculosis. In fact, by some specialists, the development of pleural effusion is regarded as a natural healing phenomenon. There is evidence to show that pleural fluid has a deterrent influence on the development and the virulence of the tubercle bacillus. But certainly not all pleurisies are benign. Dumarest has classified pleurisies into the following groups:

Tolerated Pleurisies with little, torpid, precocious effusion produced by trauma or resulting from irritation of the pleural membranes from air insufflation. In these cases, there is no fever or pain, and reabsorption sometimes occurs by itself.

Acute Febrile Effusions (serofibrinous) which may appear any time during pneumothorax treatment but frequently between the third and fifth month. Effusions are profuse, there are chills, fever, a stitch in the affected side, dyspnea, irregularity of pulse, increased expectoration, and cough. The condition passes through phases but may persist for months. It is mostly benign, often regresses, and usually disappears when air refills are discontinued, but may subsequently cause adhesions. Empyema may, however, develop from it.

For these two forms of pleurisy, it is often better, after the acute stage is over, to aspirate the fluid and refill with air.

Malignant Pleurisies, or purulent, chronic effusions with high and prolonged fever, and causing malnutrition, may develop from the above mentioned forms. The difference is not easily recognized at once; only the evolution of the disease enables one to make the differentiation. Such malignant pleurisies result in complete prostration or amyloid degeneration and usually end fatally.

With rare exceptions, there is no use for oleothorax in benign pleurisies, but in malignant cases, the first step in any intervention should be an oleothorax. Even if the operation is unsuccessful, the patient is improved and thereby placed in a more favorable condition for further surgical interference, such as rib resection or thoracoplasty. For an empyema complicating an artificial pneumothorax (which means pleurisy with tuberculous lesions), oleothorax is the only choice as thoracotomy is almost always fatal. Thoracoplasty done for tuberculous pleurisies in general leaves a persistent fistula; oleothorax, if properly done, is entirely harmless. For secondarily infected pleurisies (streptococcic, pneumococcic), drainage and not oleothorax is the proper treatment.

Oleothorax for Lung Perforations

The use of oleothorax for lung perforations is very limited. A small perforation as the result of the breaking of adhesions or a rupture into the pleural cavity of a small, subcortical vomica not connected with a bronchus, justifies an oleothorax. Unfortunately, not very often are we able to differentiate the small, benign perforation from a large, fatal one. (The author describes differential signs.)

Temporary perforations do not need an oleothorax. Valvular perforations, not helped by deflation, are benefited by oleothorax. Large perforations are mostly fatal, but if unilateral and recognized at once, thoracoplasty is a help. Burnand and Roussel, however, injected oil in such cases, thereby disinfecting the pleura and placing the patient in better condition for a final thoracoplasty.

Use in Adhesions

With oleothorax, adhesions may be avoided or prevented, though not all adhesions need an immediate oleothorax. (The beginning of adhesions can be foreseen by manometric readings and fluoroscopy.) In unsuccessful pneumothorax, for instance, in partial pneumothorax when only one part is collapsed far from a cavitation which remains open, air insufflations are not only useless but also dangerous because of the necessary high pressure.

Other Indications

Mediastinal hernia or bulging produced by low pressure on the opposite side of a pneumothorax may be reduced by oleothorax. Finally, in exceptional cases, if patients are not able to stay in the hospital or to return for refills, a pneumothorax may be changed into an oleothorax, which requires refills only about every two months.

*Reprinted from *Tuberculosis Abstracts,* a review for physicians, issued monthly by the National Tuberculosis Association, October, 1931, Vol. IV, Number 10.

TECHNIC AND RESULTS

Accidents have occurred from the injection of badly or anciently prepared, not-neutralized vegetable oil. But if all precautions are taken in its preparation, there is no great difference in the choice of the kind of oil used. The power of reabsorption depends more on the individual than on the kind of oil. The vegetable oil is milder for the pleura and not so irritant as mineral oil. The author uses mineral oil when he wishes to avoid thickening of the pleura and to produce more compression, while the vegetable oil is used mostly in empyemata.

For the last few years, he has treated many patients with oleothorax and has not had one death directly from the operation. Reported cases of death are probably due to neglect of the pressure which oil produces —a most important factor.

Of the four case histories cited by the author, the following is quoted:

Case 2: Miss A. B., age 21, admitted July 29, 1929. *Diagnosis:* Chronic pulmonary tuberculosis. *X-ray Report:* Bronchopneumonic type of pulmonary tuberculosis, mainly unilateral. *Left Lung:* Diffuse involvement of entire lung with multiple cavities in upper lobe. *Right Lung:* Negative, except for some hazy appearance at apex and increased size of hilar lymph nodes (?); lower bronchial roots somewhat prominent.

January 30, 1930: Initial pneumothorax 400 c.c.,-4, -1). *February 20, 1930:* After several refills, re-examination of the chest shows left-sided hydro-pneumothorax, with fluid level up to third interspace and displacement of mediastinum and trachea to the right. In the region of the left upper lobe is seen some lung tissue, with well defined and sharply demarcated area of lessened density which are undoubtedly uncollapsed vomicæ held by adhesions to the chest-wall.

February 24, 1930: Lemon-colored fluid aspirated from left chest (500 c.c.); 30 c.c. of oilgomenol injected; normal reaction. Patient had in four- to six-day intervals several injections until complete blockage was obtained by June 30, 1930. Since the last injection, we control the amount of oil once every four weeks. The reabsorption of oil in this case since a blockage was obtained was very slow, and we injected only 5 to 10 c.c. of oil once a month.

This case is particularly interesting. Why did we change an acute febrile effusion into an oleothorax and what effect was obtained by an oleothorax) Because in spite of the effusion, the cavitations in the upper lobe were open on account of adhesions and because a menacing mediastinal hernia (bulging) occurred which interfered with the further pneumothorax insufflation. After 2 to 3 months of oil treatments, we obtained a rigidity of the mediastinal pleura, the hernia disappeared, and we were able to inject a considerable amount of oil without fear of rupture. In the meantime, the patient developed after a pneumonia a right-sided pulmonary lesion. We feared to perform a right-sided pneumothorax on account of the left-sided oleothorax, and decided to inject sanocrysin intravenously. The patient is now in a very good condition.—*Aleothorax, L. E. Oppengame, Amer. Rev. of Tuberc., June, 1931.*

PEDIATRICS

STUDIES ON THE INCIDENCE OF TUBERCULOUS INFECTION: Elizabeth Leggett and F. F. Callahan (Amer. Rev. Tuberc., XXIV:2:113-135. August, 1931). The authors report a recent study on the incidence of tuberculous infection in several different groups of Minnesota school children. Results are compared graphically with those of similar studies elsewhere, and are shown to be lower in this series than those in larger cities as Vienna, Philadelphia and Minneapolis, but higher than for rural Minnesota or rural Hennepin county. Two different groups in Saint Paul were tested, the total number being about 600. The one group came from middle-class homes where known exposure was low. Of these, 20 per cent showed a positive Mantoux, and 6 per cent had X-ray findings of tuberculosis. The second group came from poor homes but here also the history of exposure was low. Of these, 22 per cent had a positive Mantoux; 7 per sent had X-ray findings. These figures are compared with the incidence in Minneapolis school children of 47 per cent as reported by Myers and Harrington. In the Pine City schools, 265 children were tested. Under 12 years, only 4 per cent were found positive as against 25 per cent in the high school group. The high incidence in the older children was explained by definite exposure to an active case of tuberculosis in a teacher. Work on a fourth group in Morrison county, where the incidence of the disease is known to be high, will be reported later. Of 274 children already examined, 31 per cent reacted positively. In both the Pine City and Morrison County groups, cases of active adult tuberculosis were found, while there were none in the St. Paul children studied. A limited study of autopsy material is added.

The authors stress the value of tuberculosis surveys in schools and emphasize the fact that a teacher with active pulmonary tuberculosis is a definite source of infection to children.

L. G. Frary, M.D.

THE EFFECT OF PASTEURIZATION UPON THE VITAMIN C CONTENT OF MILK IN THE PRESENCE OF CERTAIN METALS: E. W. Schwartze, F. J. Murphy and G. J. Cox (Jour. Nutrition, 4:211, July, 1931). The Vitamin C destruction in fresh milk samples pasteurized aërobically in aluminium, tinned copper, and copper was determined quantitatively by measuring their values in preventing scurvy in guinea pigs. The destruction was placed at 20 to 40 per cent in aluminum. This is greater than that obtained upon boiling milk for 5 minutes, and is rather to be expected as the duration of exposure in pasteurizing is much longer and is strictly aërobic. The effect of pasteurizing milk in tinned copper was slightly greater than that found in aluminum, referable the authors believe to the small amount of copper exposed to the milk when in the tinned copper pasteurizer.

The pasteurization of milk in naked copper resulted in a destruction of at least 80 to 90 per cent of the antiscorbutic vitamin. Since less than 20 to 40 per cent

of the loss must be charged to the aërobic pasteurization process itself, a greater portion of the loss must be attributed to copper.

The practical importance of these experiments is that copper is shown to be unsuited for construction in dairy equipment so far as the conservation of Vitamin C is concerned. Tinned copper is likewise unsatisfactory, but no difference was found between pyrex glass and aluminum. Aluminum, therefore, is as satisfactory a material as we have for construction of dairy equipment so far as the destruction to Vitamin C is concerned.

C. A. STEWART, M.D.

PHENYLETHYLHYDANTOIN: ITS USE IN CHOREA: S. W. Marick, M.D., Pittsburgh (Arch. of Ped., Vol. XLVIII, No. 8, August, 1931). Neither the dosage nor the modus operandi of phenylethylhydantoin is entirely agreed upon. It is generally administered until fever and a rash are produced. Most writers state that the result of administering phenylethylhydantoin in chorea is not due to the sedative effect of this drug, but to a specific reaction akin to "serum sickness." Most German writers stress the importance of the fever and rash. In the author's experience neither was a constant factor and improvement followed where both were absent. In fact, they failed to develop a reaction in about one-third of the cases, including some that improved promptly. They are of the opinion that it takes a certain concentration of the drug in the system to produce the toxic rash and fever, and that reaction is no way specific. The drug was not continued beyond two weeks.

Phenylethylhydantoin is administered for general purposes in doses of 0.2 gm. to 0.5 gm. although Bressler advocates doses up to 1 gm. in the more serious diseases of the nervous system. A large dose is generally given once a day.

Usually, between the eighth and fourteenth day, fever and a morbilliform rash appear, first on the wrists, then on the chest, abdomen and limbs. Fever and rash last four or five days and then disappear. As the rash and fever subside, improvement is noticed.

In most of the cases, definite improvement was noticed about one week after the conclusion of the course of treatment.

Over a score of cases of chorea were treated with phenylethylhydantoin. Most of these cases were mild or moderately severe. The results, as a whole, were good.

R. N. ANDREWS, M.D.

LOSS OF IMMUNE SUBSTANCES FROM THE BODY. II. DIPHTHERIA ANTITOXIN IN HUMAN SALIVA: J. K. Sugg and J. N. Neill (Jour. of Immunol., 20:463, June, 1931). Sugg and Neill report the presence of diphtheria antitoxin in the salivas of "naturally" immune persons and of one toxoid immunized person, demonstrated by the toxin neutralizing properties of the saliva of such individuals. They feel that the toxin neutralization by the immune salivas was due to true antitoxin and not to inactivation or destruction of the toxin by some non-immunological constituent of normal saliva. The action of salivary enzymes was ruled out by control tests with unheated salivas of non-immune persons, and the antitoxin was demonstrated by intravenous injection of guinea pigs with the saliva prior to subcutaneous or intradermal injections of the toxin. The daily output of salivary antitoxin was estimated as equivalent to about 0.07 per cent of the total amount of antitoxin in the circulating blood, at which rate a person would swallow during a year an amount of antitoxin equivalent to approximately 25 per cent of the amount originally present in his blood. Examination of stool extracts failed to detect any traces of the swallowed antitoxin, thus it was either destroyed or absorbed in the intestinal tract. The concentration of antitoxin in the saliva of immune individuals was found to bear a rather direct relation to its concentration in the blood.

C. A. STEWART, M.D.

COD LIVER OIL EMULSIFIED IN AN EXTRACT OF GERMINATING GRAINS: ITS TOLERANCE BY THE INFANT GASTRO-INTESTINAL TRACT AND ITS PROPHYLACTIC VALUE: B. Winston Jarvis, M.D., New York (Arch. of Ped., Vol. XLVIII, No. 8, August, 1931). Deficiency disease prophylaxis becomes more efficient when vitamin sources are combined in a mixture of such tolerance to the infant's gastro-intestinal tract as to permit its early and continued routine use during the very early months of life, during which time hesitancy is usually encountered in undertaking such a procedure with the more common diversified sources of such administration.

An emulsion of cod liver oil in a concentrated extract of the germinating grains of wheat, oats and malted barley is a mixture exceptionally tolerant to the infant's gastro-intestinal tract.

This emulsion contains Vitamins A, B and D; and lacks C, which should be included by adequate dosages of orange or tomato juice.

Although containing 30 per cent by volume of cod liver oil, this mixture yields a Vitamin D potency equal to that of pure cod liver oil. This is probably due to the greater availability in assimilation due to the complete emulsion by the gastro-intestinal tract and also possibly due to a coördinating activity of the A and B factors.

Within the limits of this investigation, this emulsion supplemented by orange or tomato juice apparently obviates the incidence of clinical deficiency diseases when administered routinely and continuously from six to eight weeks of life.

The author urges the greater interest of the physician in a routine use of cod liver oil emulsified in an extract of germinating grains in infancy and childhood for Vitamins A, B and D prophylaxis.

R. N. ANDREWS, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

WHAT THE PUBLIC SHOULD KNOW ABOUT CHILDBIRTH. Walker Bourne Gossett, M.D. 290 pages. Cloth. Price, $2.00. Minneapolis: The Midwest Company.

TABLES OF FOOD VALUES. Alice V. Bradley, B.S., Supervisor and Instructor of Nutrition and Health Education, State Teachers College, Santa Barbara, California. 128 pages. Price, $2.00. Peoria, Illinois: Manual Arts Press.

SURGICAL PATHOLOGY OF THE GENITO-URINARY ORGANS. Arthur E. Hertzler, M.D., Surgeon to the Agnes Hertzler Memorial Hospital, Halstead, Kansas, Professor of Surgery, University of Kansas. 286 pages. Illus. Price, cloth, $5.00. Philadelphia: J. B. Lippincott Company.

TREATMENT OF INJURY BY THE GENERAL PRACTITIONER. Clay Ray Murray, M.D., F.A.C.S., Assistant Professor of Surgery, College of Physicians and Surgeons, Columbia University; Associate Visiting Surgeon, Presbyterian Hospital in the City of New York. 2 Vols., 412 pages of text and 196 drawings by the author. Price, $5.00. Harper and Brothers, Publishers.

This is a monograph in two volumes of convenient size, designed to help the general practitioner in meeting the commoner problems of traumatic surgery. One-fourth of the work is devoted to the treatment of injuries of the soft parts, while the balance deals with fractures and dislocations.

It is a useful guide along these lines, containing much practical advice, tersely told and free from ambiguity. Especially valuable are the sections dealing with the psychology of the patient, the indications for operative interference in bone injuries and the author's own illustrative diagrams.

A few minor changes might be made in later editions. The word "débridement," which really means "unbridling one's horse," should be dropped, and the substitute "épluchage" recommended by Blake is equally misleading, even if literally correct. Why not say "excision"? That is precisely what this author takes pains to describe in detail as the proper mode of cleansing a ragged wound and it is correct and descriptive.

Then the advice to use "the pulmotor or similar mechanical appliance" for artificial respiration is in serious question until we know definitely whether or not these devices cause the air vesicle injury attributed to them by some observers.

But these are remediable matters and do not detract from the general usefulness of the work, which, above all, is to be commended for its evident freedom from cut-and-dried advice and padding of any sort.

GILBERT COTTAM, M.D.

AMERICAN PHYSICIANS AND SURGEONS. A Biographical Directory of Practicing Members of the Medical Profession in the United States and Canada. Prepared by James Clark Fifield. Price, $30.00. Minneapolis. The Midwest Company, 1931.

This large volume has been prepared for the use of physicians, hospitals and libraries to supply detailed biographical information regarding reliable and efficient members of the profession. Age, medical education, specialty, articles published, society membership, hospital affiliation are included in the information given.

In the "Foreword" of the volume the editor explains that some doctors are better than others and some are tainted with commercialism. Only those individuals are mentioned who "by reason of their high attainments, skill and reliability are especially entitled to inclusion in such a book." No claim is made that all such are included.

It is explained that final decisions as to inclusion of a name were based on the opinions of the doctors themselves. No doctor can buy his way into the directory.

The editor undertook an enormous task and how well he has accomplished it a reviewer must judge from a perusal of the data about which he is posted. It is probably true, as stated in the foreword, that more errors of omission than commission have been made. A number of names have been omitted which might well have been included. A few errors which need not have occurred were detected: An aurist classified as a general practitioner and two internists listed as graduates of Toronto instead of McGill.

How much of a demand there will be for such a directory at the price is uncertain. We venture the opinion that there will be little demand on the part of laymen in general and few physicians will have enough use for such a volume to warrant the investment.

The thought occurs that it would be well for the A.M.A. Directory to include more information in its volume and thus increase its value.

C. B. DRAKE, M.D.

MODERN PROCTOLOGY. Marion C. Pruitt, M.D., F.R.C.S. (Ed.), F.A.C.S., Associate in Surgery, Emory University School of Medicine. Cloth. Price $8. Pp. 400, with 233 illustrations. St. Louis: The C. V. Mosby Company, 1931.

This volume rescues Proctology from the esoterica of medicine; it even explains how the specialty got there (see section on hemorrhoids.) One is astonished to learn that the injection treatment of hemorrhoids was practised as early as 1871, by "a man named Mitchell." This obscure and secretive pioneer sold his method to doctors and laymen who went about curing piles, and so were known as "pile curers." Even yet, one may sense the pious fury with which such tactics were met by the profession of that day. By 1914, however, the

method was being defended by Sir James Goodheart, consulting physician to Guy's Hospital. Today the method is being taught in the medical schools.

Such conditions as fistula, hemorrhoids, stricture, tumors, prolapse, abscess, et cetera, are taken up in detail; others, such as the diseases of the colon, are less inclusive. Chapters on anatomy, examinations, and anesthesia contain a clear and adequate exposition of the subjects.

E. C. HARTLEY, M.D.

AN INTRODUCTION TO GYNECOLOGY. C. Jeff Miller. 327 pages. $5.00. St. Louis: C. V. Mosby Co., 1931.

In this work the author discusses etiology, classification, diagnosis, prognosis, general considerations, and clinical considerations of all gynecological conditions. He devotes no time to any form of treatment. The reasons he does so is set forth in his own words in the preface of his work. This work is based on twenty-five years of teaching experience, and it is his object to present something to the student and the beginner which his quarter of a century of teaching has convinced him that they need. The larger works on this subject hardly fit the need of the student, and he feels that the treatment of patients is not the business of the junior student. This is an excellent work for the beginner, and others as well.

A. G. SCHULZE, M.D.

BEDSIDE INTERPRETATION OF LABORATORY FINDINGS. Michael G. Wohl, M.D., Associate Professor of Experimental Medicine, Temple University Medical School, with an Introduction by Joseph McFarland, M.D., Sc.D., Professor of Pathology, University of Pennsylvania. Cloth. Pp. 320. Illustrated. St. Louis: The C. V. Mosby Company, 1931.

The author says, "... this book aims to correlate the laboratory and the clinic. It aims to place a proper evalution upon laboratory reports as applied at the bedside. It aims to omit such tests as are excessively complicated or whose merits are still to be proved, and to emphasize the simpler useful ones that can be performed in his own office by an intelligent practitioner. ... It aims to emphasize the fact that a laboratory report is only an adjunct to diagnosis, and not the diagnosis itself."

The consistent application of these aims to the twenty-three chapters of the book makes the volume unusually clear and instructive. The chapters deal with the usual subjects of gastric contents, sputum, blood, urine, and so forth, and also with functional tests, acidosis and alkalosis, skin reactions, and pregnancy tests.

E. C. HARTLEY, M.D.

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